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June 1984

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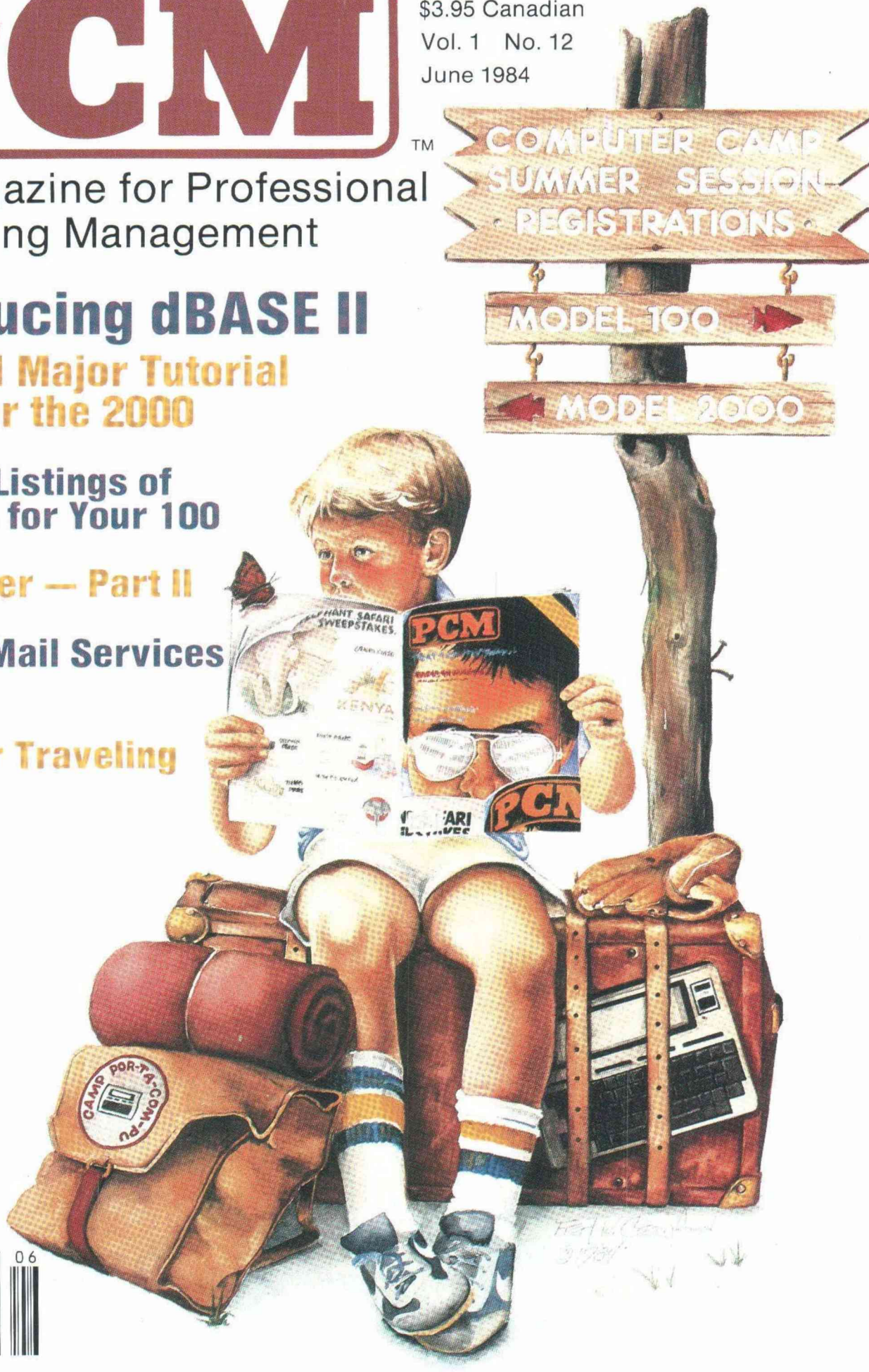

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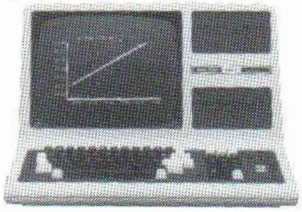

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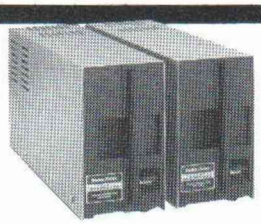

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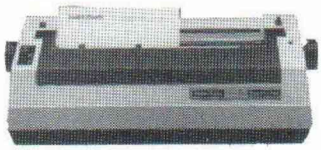

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The Magazine for Professional Computing Management

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Cover Illustration by Fred Crawford © 1984 by Falsoft, Inc.

The Joy Of Togetherness — And Farewell To A Fine Publication

First of all, I want to say "thank you" to the many, many of you who wrote in to say that they are pleased with the decision we have made to combine the Portable Computer and the Tandy 2000 in one magazine. To be honest, we were somewhat concerned that many owners of the Model 100 would think that we were abandoning them for the 2000.

That, of course, is not the case, as is easily evidenced by the May issue. But, as we were planning all of this, there was some concern.

I am pleased that all but one of the people who were kind enough to take the time to write us did, indeed, express their satisfaction with our decision. And, too, we received quite a number of comments from Tandy 2000 owners on the general theme of "thanks for giving us support."

As you will note, there is more advertising in this issue than there was before, which indicates we are continuing to grow. Again, I would ask that you do remember we need advertising to make PCM continue to expand and please mention us when you call or write to any advertiser. Or, for that matter, mention us when you call or write anyone who provides software or hardware for the 100 or 2000 — we might just pick up a little more advertising!

Speaking of advertising, one of the things which really excites me about both the 2000 and the 100 markets is that we are seeing more and more third party vendors offering products for these two fantastic machines. Despite what you might have heard in the past, Radio Shack has long realized that an active third party market is good for its business. No wonder they are supportive of magazines like PCM. It helps their business as much as it does others. I believe this is a forward-looking attitude on the part of Radio Shack; much more forward-looking than that of, say, Commodore, which makes it almost impossible to sell many products which compete with their "own."

Commodore, for example, has two of its own magazines, and these compete with magazines produced by other companies. That is difficult to understand — the way which Commodore tries to dominate its market. Radio Shack (and some other manufacturers) have proven that the more healthy the third party market, the more healthy the sales of their computer.

Contrast Commodore's two magazines with a decision Radio Shack has made that you should have just heard about by now. They have decided to cease publication of their *Microcomputer News* newsletter and to allow all subscribers to continue getting information from the existing magazines in the market.

In the past couple of years, under the leadership of Bruce Elliott, *Microcomputer News* has grown to be a well-done professional publication. But Radio Shack has decided that, rather than compete with magazines like PCM, it will give them more support. You will be able to either subscribe or extend your PCM subscription for the term left on any subscription you had with *Microcomputer News* — even if you got the subscription at no charge when you sent in your computer's registration card!

That is certainly a help to us in building our subscription base. And we thank Radio Shack for it. But, even more important, I believe it means Radio Shack wants to be a cooperative force in the microcomputer marketplace. And that, I think, bodes well for us all.

I do hope that when you have the opportunity, you will extend your PCM subscription and make sure your friends know about Radio Shack's offer, too. It means an opportunity to receive the finest source of information on the Model 100 and Tandy 2000 at no cost for the duration of your *Microcomputer News* subscription.

One of the other gratifying things about the 100 and 2000 market is the quality software coming into being. Radio Shack's Express Order Software program is an excellent way to bring more products to market, and the availability of many of these products is a boon to all of us.

Let me mention, also, two programs — one for the 100 and one for the 2000 — that should, I believe, have a real impact on the market. In the 100 field the program is called *T-Base*, a relational database just released form Traveling Software. We have seen an advance copy of *T-Base* and it looks good, allowing you to borrow information from one file and use it in another. When you take a database and add spreadsheet-like capabilities which *T-Base* has, you have an extremely powerful tool.

In the 2000 area, you have heard of the program's name: *1-2-3* by Lotus. But, Radio Shack tells us, *1-2-3* will be running on the 2000 shortly, and since this particular program is such a high-profile item, it should have a significant effect on 2000 sales. What is especially interesting, though, is that *1-2-3* will not only run faster on a 2000 than an IBM PC, but its display will also provide greater resolution!

In short, I think we have only seen the beginnings of success for the 100 and the 2000. Each, by themselves, are outstanding tools and, together, they make an unbeatable combination. This will only become more so in the months ahead as programs such as *T-Base* and *1-2-3* begin to become available.

— Lonnie Falk

PCM

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Letters

PRESSING A POINT

Editor:

I detect (through the story in this month's [April '84] issue and by the slug on your postage meter) that there is going to be an effort on PCM's part to begin including other computers into the magazine. I hope this is not the case. There are many of us Model 100 users who could care less about other Tandy products, but are fanatic about the 100.

I use the 100 daily in my travels with the governor for story preparation and distribution, for UPI news checks through The Source (BBS), etc. It is a word merchant's dream come true. We use it in conjunction with Apple IIs and Apple IIIs here in my office.

Hank Lindsey
Press Secretary to the Governor
Frankfort, KY

Editor's Note: As you can see from the past several months, we have included the Model 2000 as a point of focus along with the Model 100 in PCM. However, please note that we have also increased our total number of pages in order to accommodate this addition without slighting those solely interested in the PoCo.

TEL IT LIKE IT IS

Editor:

PCM is great! I have found it to be very helpful. I was leafing through the March '84 issue when the listing of countries and capitals in Robert Frowenfeld's geography quiz program caught my eye. I was surprised to see Tel Aviv as the capital of Israel, since it never was, and probably never will be. Jerusalem is the capital — spiritually, for over 3,000 years, and politically, since 1948.

On another matter — I found Jim Hawk's "Travels with PoCo" article particularly friendly and useful.

I'd love to see a charting program for the CGP-115.

Thank you — and keep up the good work!

Dr. Joel N. Orr
Orr Associates, Inc.
Danbury, CT

ANNOUNCEMENT FROM ATHENS

Editor:

We would like to announce that we have formed a computer club in Athens, Greece.

This is not a specific users group as all major computers are represented and some not so major.

The club is located on Hellenikon Air Base and correspondence can be sent through the military mail system by using the following U.S. address: Olympian Computer Club, Box 4277, APO New York, 09223.

Paul A. Mullens
Athens, Greece

SUGGESTED LIST

Editor:

I am in receipt of my first issue of PCM and am delighted with it! Keep up the good work. I would suggest a column in which a list of books on the Model 100 are listed, along with where they are available. Not reviews, which you are already doing, but merely a list. Perhaps you could act as a one-point distributor of Model 100 books, and software, too.

Himanshu Nath, Esq.
Calcutta, India

Editor's Note: Thank you for the kind words and suggestions. The one resource for the Model 100 which we are interested in distributing is PCM; the rest, we feel, are best left to our advertisers and others already in that business. As for publishing a list of books on the Model 100 (and for that matter, for the Model 2000), that is something we would like to do at some point, providing we develop enough information to make it fairly comprehensive.

BEST CODE BAR NONE

Editor:

First of all, I would like to thank you for the great job you're doing with PCM. The addition of the program listings in bar code format is a super idea. It provides a foolproof way of entering the programs without error, which saves much time normally spent in debugging typos.

I would like to inform your readers that our firm has done some work with hardware handshaking on the RS-232 port using the "Request to Send — Clear to Send" protocol. This is necessary for using the Model 100 with other computers that do not use the XON-XOFF software method of handshaking.

We would like to hear from anyone doing similar work with hardware handshaking or from anyone interested in our method.

Kelly Nehowig
Applied Logic Eng.
New Hope, MN

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Mastering MS-DOS

Part II

More basics on using MS-DOS and an introduction to MS- DOS commands

By Danny Humphress
PCM Technical Editor

Congratulations are in order for you brave souls who joined me on my trek through the outer barriers of MS-DOSdom. Perhaps some of you were eager to forge on into the unknown without my wise guidance. Don't be so anxious, my friends, that you will go on ahead of the party and find yourselves lost in the abyss of directories, files and commands. We're going to take it slowly and carefully, shining our lamp beams down each dark corridor before we proceed, and taking care not to overlook any precious finds along the way.

If you'll remember from our previous explorations, we learned about what MS-DOS does and how it communicates with the components of the computer. We also uncovered some of the mysteries of files and directories. As you earn MS-DOS experience through our travels, you will gain wonderful insights as to how to put what you've learned to use.

(Danny Humphress, PCM's Technical Editor, is the owner of a computer software and consulting firm in Louisville, Ky. Danny brings to PCM his extensive experience with small business computers and applications software.)

In the excursion into the world of MS-DOS, we're going to finish going over basic MS-DOS survival tactics and begin to discover some of the many commands that our operating system provides.

Entering The World Of MS-DOS

You enter the World of MS-DOS each time you turn on your Tandy 2000 and put a disk in. Tandy 2000HD users have MS-DOS stored on their hard disk, so they don't even need a floppy disk. After the computer briefly checks itself and makes sure that there are no obvious equipment problems, it starts reading MS-DOS from the floppy or hard disk. It is at this point that MS-DOS takes control and displays its name, version number, and a lot of copyright notices to give credit where credit's due.

MS-DOS is so disoriented when you wake it that it doesn't even know what day or time it is. It will ask you first for the date and then for the time. It always thinks it's January 1, 1980 when you turn it on — talk about disorientation! Unlike most computer programs though, MS-DOS understands if you don't like to use leading zeros and slashes and the like. To enter a date of June 9, 1984 for example, you would type any of the following:

6/9/84 06/9/84 06/09/1984
6-09-84 6-9-84

You can also just bypass entering the date and let the computer think that it really is January 1, 1980, by pressing ENTER without entering a date. I don't suggest this, however. As you will see, MS-DOS needs to know the correct date in order to give you correct information and for certain commands to work properly.

MS-DOS is a bit more particular about how you enter the time. It requires you to use European (military) time conventions (2:15 p.m. is 14:15). It also wants you to use colons between the hour, minutes and seconds and a decimal point between the seconds and hundreths of seconds if you want to be that accurate. The general format for entering the time is HH:MM:SS.nn where HH is hours, MM is minutes, SS is seconds and nn is hundreths of seconds. You need not bother with entering the seconds or fractions of seconds if you don't want — just entering as much of the time as will suit your purposes. The following are examples of properly entered times:

13:01:57.90	(1:01 p.m. 57.9 seconds)
11:05:41	(11:05 a.m. 41 seconds)
14:48	(2:48 p.m.)
16	(4:00 p.m.)

As with the date, you can just press ENTER here without entering a time. MS-DOS will start with 00:00:00.01 and count from there. Entering the time is not nearly as important as entering the date (I usually skip it), but it can be useful if you want to keep track of when during a day files are updated — more about that later.

MS-DOS Is At Your Command

Once it knows the date and time, MS-DOS stops asking questions. It is up to you to tell it — in its own language, of course — where you want to go and what you want to do. It just displays a "prompt" on the screen and patiently awaits your command.

One of two prompts may appear on the screen depending on whether you are using a floppy disk or not. If you are using a floppy disk system, or you have a disk in the floppy drive of your Tandy 2000HD, you will get a "A>" prompt. Hard disk booters are greeted with a "C>" prompt.

Remember in May when we talked about device names. Do 'A' and 'C' look familiar to you? They are device names for disk drives. 'A' is the name of the first (bottom) floppy disk drive and 'C' is the name of the hard disk drive.

What MS-DOS is telling you here is that any command you enter now will, unless you specify otherwise, take place on this particular disk drive. This is called the *default* drive. If you do not tell MS-DOS on which drive to perform a command, it will use the default drive. Likewise, if you want to access a file on drive B: and A: is your default, you must either change the default or specify drive B: when you access the file. This is important to remember.

Because the hard disk drive C: is the most often used drive on a hard disk system, the default drive if you have a hard disk is drive C:. Any commands you enter will default to drive C:.

If you want to change the default drive to another drive, you simply type the drive letter followed by a colon and press ENTER. For example, to change the default drive to B:, enter B:. That's simple enough.

Communicating With MS-DOS

As with most computers, we communicate with our Tandy 2000 through its operating system (MS-DOS) by way of the standard human interface (the keyboard). MS-DOS does not care whether we enter our requests in UPPERCASE or lowercase or any CoMbInAtIoN of upper and lower. It gets our message either way.

You let MS-DOS know your wishes by using specialized commands that it understands. Most of these commands involve "parameters" that give the specifics of how the command is to work and "path names" that tell MS-DOS which files and which disks or devices to use. A parameter usually follows the command. Each command has its own special syntax that we must learn in order to use them properly. Fortunately, most commands are similar enough for us to figure them out once we know the basic rules.

Some commands have required and optional parameters. For instance, we may not need to enter a disk drive name because we want the computer to use the default drive.

In general, there are only a few basic *types* of command parameters. There are *filespecs* (file specifications) which include any or all of a drive name, directory names, and a file name. There are *arguments* which are a set of parameters from which you choose such as "ON" and "OFF." And we have *switches* that tell the command to act in a certain way depending upon the specific command.

As we learn about each individual command in MS-DOS, we'll explore the parameters that the command uses and how it changes the results. Once you begin using some of the "everyday" commands, you will be able to use your common sense to figure out how to use the others without ever having to crack the MS-DOS manual.

Learning The Native Tongue

MS-DOS has a language all its own. While it's very similar to our familiar English in many ways, it's more similar to Orwell's Newspeak with its rigid rules and sterile, efficient syntax. Fortunately for us, though, learning the language of MS-DOS is not nearly as difficult as learning a human language. There are only a few dozen words and only a handful of those will be used in everyday communication with your computer.

Unlike the *MS-DOS Reference Manual* that was packed with your new Tandy 2000, we're not going to go over each command in alphabetical order from BACKUP to VOLUME. Instead, we'll begin with the fundamental commands and work our way up to the bells and whistles.

It's now time to hit the power switch on your Tandy 2000 (turn it on — not off) and get ready to do some exploring!

Format

Before MS-DOS can begin to put data on a floppy disk, the disk needs to be prepared to receive the data. This is called "formatting" a disk.

Have you ever tried to write a lengthy letter on a piece of blank, unruled paper? Of course you have. It's not easy to make nice neat lines across that paper, is it! It's even more difficult for a computer to write data on a blank floppy disk. Orderly as it is, the computer needs to be able to write the data on the disk in a neatly organized fashion. It needs to have those little lines to guide it along the disk. While formatting does not physically put lines on a disk, the effect is very similar.

The first thing you must do to a new disk is to format it. And this is the first command we're going to learn about.

Let's get started by "booting" (getting everything up and running) our system with the disk labeled *MS-DOS/BASIC* that came with your Tandy 2000 in the bottom drive. Enter the current data and time when the computer asks. If you have a Tandy 2000HD with a hard disk, just turn on the computer — there is no need for a diskette (you should have already followed the directions that came with your 2000HD that explained how to initialize your hard disk).

After entering the date and time, you'll be greeted with an "A>" prompt ("C>" if you have a hard disk).

Get a blank disk. If you don't have one, go out right now and buy a box — you'll need them. Put this disk in the top drive of your computer (drive B:). What! No top drive? If you have no top drive, you have a Tandy 2000HD with a hard disk. Put the blank diskette in the only disk drive (drive A:).

Now, are we ready? Type the following command:

```
FORMAT B:/S   or
FORMAT A:/S   if you don't have
              a hard drive
```

We are telling MS-DOS to prepare the disk in drive B: (or A:). The "/S" is a "switch parameter" that tells the format command to make room, and copy MS-DOS to this disk. When a disk has MS-DOS on it, it is called a "system" disk. A disk with the system on it should always be in drive A: when you're using the computer. If you have a hard disk, the system is stored on it and you don't need to have a system disk in drive A:. More on this later.

MS-DOS's FORMAT command will display:

```
Insert new diskette for drive B:
and strike any key when ready
```

Put the disk in the specified drive, if it is not already there, and press any key on the keyboard.

Important: Format *completely erases* anything that is on a disk, so be sure that you are formatting a new disk or that you really want to erase the disk in the format drive!

FORMAT will display "Formatting tracks" and a line of eighty dashes across the screen. As format works, each dash will change to a period. If a dash changes to a question mark, there may be problems with the disk (or your disk drive). Try the process again with the same disk and, if you get the same results, try another new disk.

When the format is finished, you will be asked if you want to format another disk. You can go on formatting as many disks as you like. For now, press 'N' for no.

We will again have an "A>" or "C>" prompt telling us that MS-DOS is awaiting our next orders. The disk in the drive is newly formatted and is now ready for computer use.

There are a couple more things that FORMAT can do, but we'll save that for a little later.

The Most Important Commands

It is amazing how much we trust to the whim of a machine. We entrust this unthinking box with some of our most valuable possessions — time and money. When we store our precious data on a computer's floppy or hard disk, we assume that it will be safe and sound and that only a natural disaster could bring harm to it. Not so, my friends! What would happen if, for instance, the computer that handles PCM's mailing list decides to delete all the names and addresses — it did happen. Can you imagine what it would take for us to rebuild this mailing list! Our only savior was that we religiously make "backup" copies of the data for just such an emergency. What could have been weeks of work and thousands of dollars in expense turned out to be only a minor inconvenience.

When you purchased your Tandy 2000, you received a single disk entitled *MS-DOS/BASIC*. This is your "master" MS-DOS disk. You should use it for only one thing — making a copy of itself. This is true of any software package that you purchase. Use the original to make a copy and put it away in a safe place. Note, however, that some software cannot be copied. The software publishing company usually gives you a spare or offers to replace it for a nominal fee.

Once you start using a program, the information on the disk or disks becomes even more valuable than the program itself because you have added to it what cannot be replaced by a software publisher — your own data. It is imperative that you copy this important data on a regular basis (and keep several copies) to avoid a "data disaster."

The same holds true, even more so, if you are keeping your programs and data on a hard disk. There is so much to lose if something goes haywire with your hard disk drive.

MS-DOS provides several ways of copying entire disks. To copy a floppy disk, the most common method is to use COMPDUPE. This command performs several functions. It will format a blank disk, copy the entire contents of the disk in drive A: to drive B:, and compare the two copies to make sure that there were no errors in copying. If you are using a Tandy 2000HD, you may want to just skim over the discussion of COMPDUPE; there is another copy command made just for your hard disk.

COMPDUPE is short for "compare/duplicate," which really sums up what this command is all about. It makes a mirror-image copy of the floppy disk in drive A: onto the disk in drive B:.

Put your MS-DOS master disk in drive A: and a blank (or formatted) disk in drive B:. Type the following command:

```
COMPDUPE /D
```

The "/D" is a switch parameter telling COMPDUPE to work in the "duplicate disk mode." If you don't use the "/D," COMPDUPE will simply *compare* the two disks and not copy them.

The screen will clear and a copyright message will appear. You are told to press the space bar to continue or to press CONTROL 'C' to abort. Press the space bar and let's get things moving.

As with FORMAT, there will be a line of 80 dashes across the screen. During the process, each dash should turn into a period. If not, there may be problems with one or the other disks or the computer. Try again.

After successfully copying and comparing the disks, you will be asked if you want to copy another. Like FORMAT, you can do this till the power goes off or you run out of disks. Let's just press 'N' for no and return to the "A>" prompt.

For those of you who are using Tandy 2000HDs with hard disks, there is a special command for copying data from the hard disk to floppy disks.

The reason we need a special command is that a hard disk can store many times the amount of data that can fit on a floppy disk. The hard disk's BACKUP command allows you to copy all or a portion of the hard disk onto multiple formatted floppy disks.

BACKUP is a very powerful command with many parameters. For today, we'll use it in its simplest form. I could spend a whole month's column just on the different uses of BACKUP (and I will later).

Unlike COMPDUPE, BACKUP will not format disks for you. You must use the FORMAT command to get enough disks ready before you use BACKUP. It will take about 14 disks if your hard disk is completely full and you are copying the entire disk. It is a good idea to have a bunch of formatted disks on hand, because once you start your backup and you run out of disks, you'll have to quit, format more disks, and start the backup process from square one.

If you just got your computer, chances are that your hard disk will be almost empty. Going from that assumption, format two or three disks to get ready to make a backup.

With formatted disks in hand, type the following command at the "C>" prompt:

```
BACKUP C: A: /S
```

This tells MS-DOS to copy the contents of drive C: to drive A:. The "/S" is a switch parameter telling BACKUP to copy all the files in all the directories on the hard disk.

You will be warned by BACKUP that you will erase all the files on the destination disk (A:) and asked to insert a disk to receive the backup data in drive A:.

When you strike any key to continue, the backup process will begin. Data will be read from the hard disk (C:) and copied to the floppy disk (A:). If the floppy disk fills, you will be prompted to insert another disk in drive A: and the process will continue.

BACKUP has a sister command, RESTORE, that moves data from backup disks to the hard disk drive. We'll explore this command a little later.

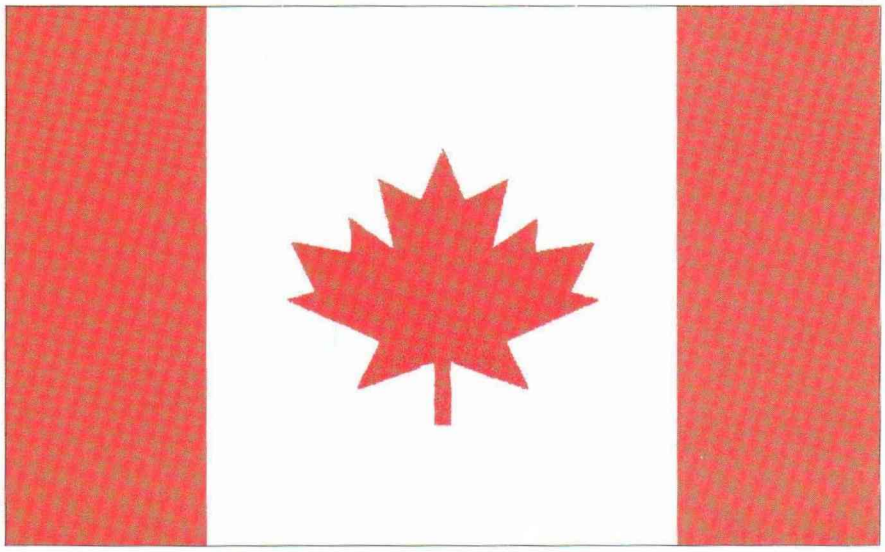
Next Month

In July, we'll explore some of the other fundamental commands of MS-DOS. Of course, you will by now be using some of these commands on your own — good. After we've introduced ourselves to them, we'll take a closer look at what makes them tick. Until then . . .

PCM

Flag of the Month Club

By Wayne Sanders



May's PCM featured a BASIC program that reproduced the Star Spangled Banner on your Model 2000's CM-1 Color Monitor and gave you the option to print it on the CGP-220 Ink Jet Printer. We thought it would be interesting to continue with this idea by printing a BASIC program for a different flag each month and challenging you to see how well you can reproduce national and state flags on your own. Send your creations to PCM. If we like them, we'll print it as a feature in the Flag of the Month Club.

We went north this month to find our featured flag, the Canadian Maple leaf. While the flag is only two colors, red and white, it beautifully showcases the high-resolution graphics of the Model 2000.

If you have a Radio Shack CGP-220 Ink Jet Printer at your disposal, you can print the Canadian flag by changing line 1000 to read:

```
1000 SP=0
```

You'll need to have *CGPDMP.BIN* on your default drive and reserve memory for it when you enter BASIC by typing (at the MS-DOS prompt):

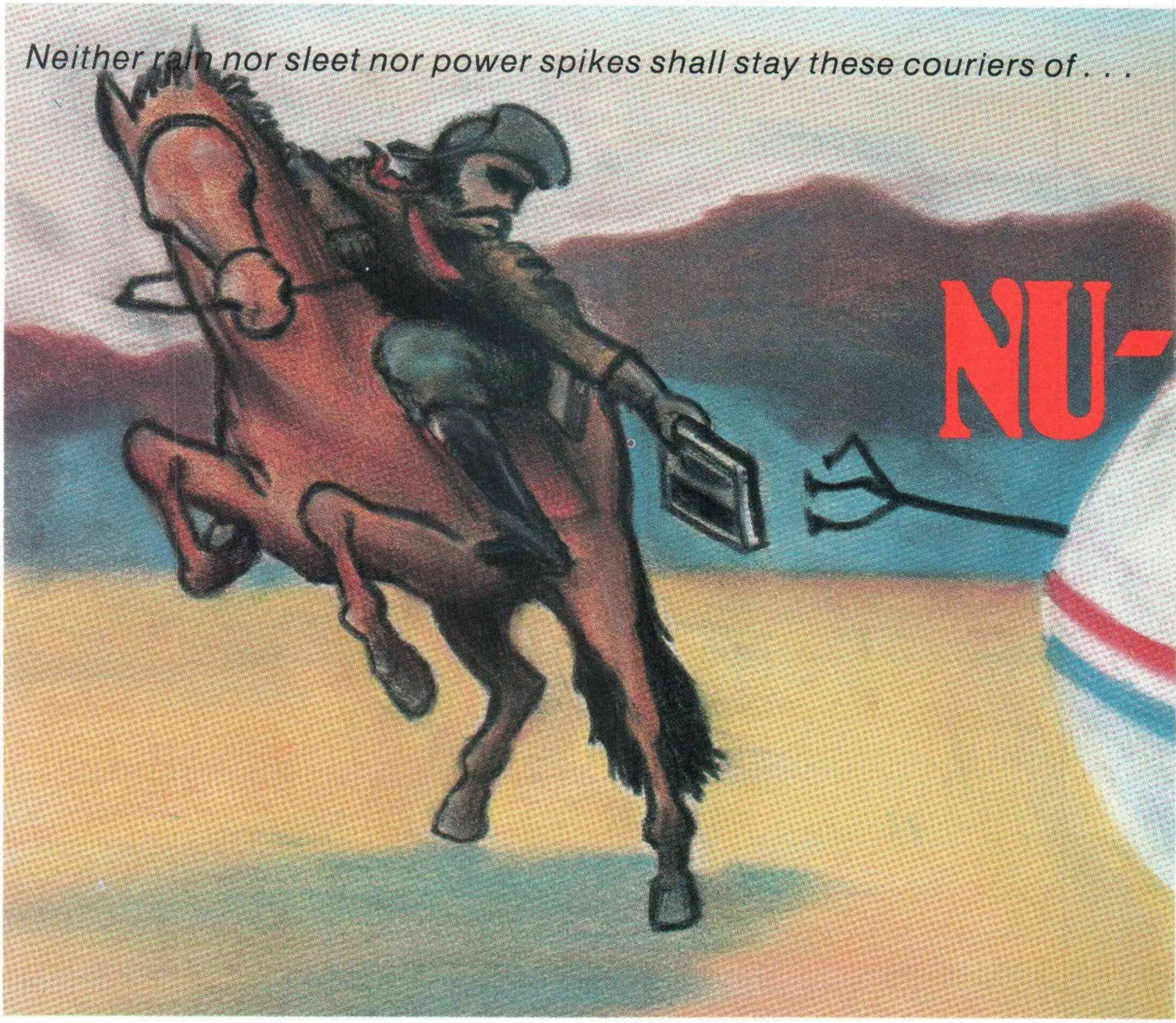
```
BASIC /M:&HFF00
```

The above is for 256K systems, if you have only 128K in your Model 2000, substitute "7700" for "FF00" when you enter BASIC. Also change the "FF00" in line 1010 of the program to "7700".

The listing:

```
1000 SP=0
1010 IF SP THEN CGPDMP=&HFF00:BLOAD"CGPDMP.BIN",CGPDMP
1020 SCREEN 3:PALETTE 1,4:PALETTE 7,15
1030 CLS:KEY OFF
1040 XR%=640:YR%=400
1050 C%=XR%/2:XF=XR%/256*.8:YF=YR%/191:YO%=YR%/2+20
1060 LOCATE 1,1,0
1070 LINE (0,0)-(XR%-1,YR%-1),7,BF
1080 LINE (0,0)-(XR%*.23,YR%-1),1,BF
1090 LINE (XR%*.77,0)-(XR%-1,YR%-1),1,BF
1100 READ X%,Y%:PSET (X%*XF+C%,YO%-Y%*YF),1
1110 FOR I%=-1 TO 1 STEP 2
1120    FOR J%=1 TO 13
1130       READ X%,Y%
1140       LINE -(C%+X%*XF*I%,YO%-Y%*YF),1
1150    NEXT J%
1160    RESTORE
1170    READ X%,Y%
1180    PSET (X%*XF+C%,YO%-Y%*YF),1
1190 NEXT I%
1200 PAINT (C%,YO%),1,1
1210 LINE (0,0)-(XR%-1,YR%-1),0,B
1220 IF SP THEN CALL CGPDMP(ER%)
1230 GOTO 1230
1240 DATA 0,56,8,37,24,45,18,19,35,31,34,18,56,22,47,4,58,1,23,-14,32,-31,3,-21,
3,-43,0,-43
```

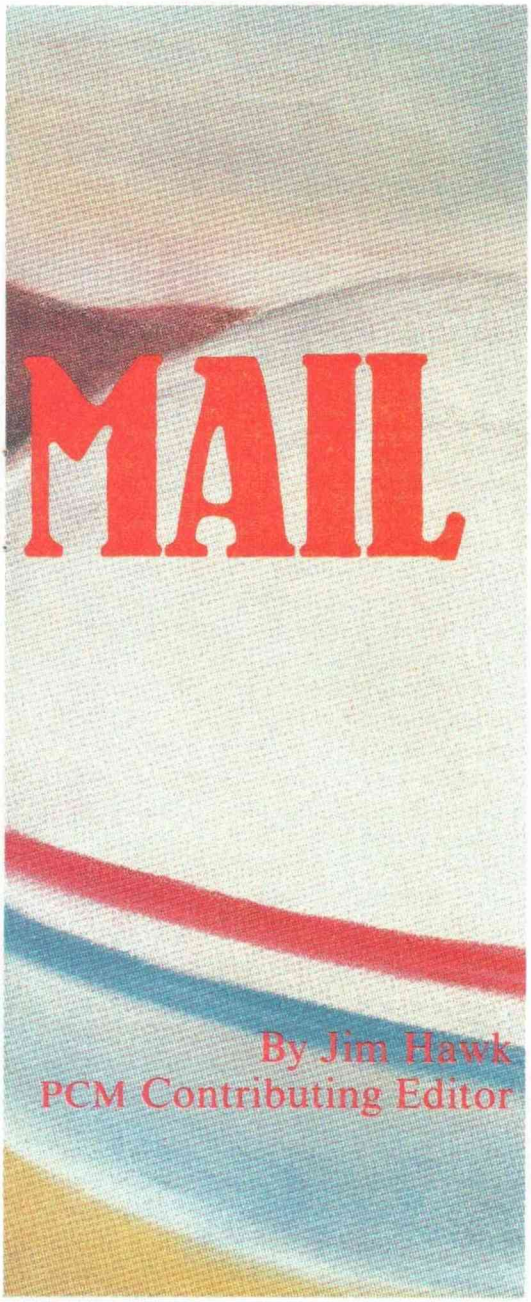
PCM



There are some remarkable new services available for getting your thoughts on paper, and delivered to someone else. A lot of people must have wondered why a telecommunications firm didn't offer personal computer users the ability to order high-quality printed documents and have them delivered. Now, several new services have popped up in the past few months. It only makes sense — many of us had to decide on a high-speed dot matrix printer to keep up with online information services, while sacrificing letter-perfect quality. MCI Mail and EasyLink wondered why not buy the very best printer and rent it out to people on a rotating basis? Laser printers or multi-color dot matrix printers run into the thousands of dollars and most of us can't justify a second printer — these new customized electronic mail systems neatly solve the problem and let you do some amazing graphics that would be beyond the 100's normal abilities.

After a money-losing false start with the postal service, electronic mail has now blossomed as another major service that lets home and office computer users interact with the real "hard-copy" world out there. The best news of all is that your Model 100's built-in *TELCOM* program is among the best there is to get the job done quickly and easily. Basically, your 100 can upload the text of a letter to a central computer hooked up to a high quality printer — it will be automatically printed, stuffed into an envelope and dropped in the next day's mail. It's a mix of new-tech computer telecommunications, satellites and advanced printers combined with the old hand-delivered methods of the postal service. Right now, a pair of billion dollar companies are battling to become dominant in the field: MCI and Western Union. Both are offering consumers undreamed of abilities to send messages — each with their own advantages and drawbacks. A third much smaller firm in Connecticut has decided to go directly after Model 100 users by designing a special software program that automates the whole process to almost one-button letter sending: (after prompting you to write the letter in the first place)

(Jim Hawk has been working in radio news for the past 12 years and has a science and electronics background. He also does free-lance writing in Washington, D.C.)



the program goes into *TELCOM* mode, then calls up Tel-Letr in Mystic, Conn. and gives the proper verification codes, uploads the letter, uploads the address or addresses, and eventually returns control back to you with a beep. This merging of computers and mail is among the fastest growing areas in telecommunications: a dozen other "electronic mail" companies, now confined only to switching messages between computers, are at least considering plans to go "hard copy."

I've spent the past few months testing out MCI Mail, Western Union's EasyLink Instant Mail, and the Tel-Letr system by Gunther International. After seeing the quality available from these services, I no longer feel a pressing need to get a daisywheel printer to compliment my dot-matrix speedster.

MCI Mail: Pushbutton Letters

MCI is best known for offering cut-rate long distance telephone service, but the company made a big advertising splash last winter to sell people on MCI Mail. You may recall the TV ads showing a marble-columned U.S. Post Office with a speeded up construction crew working on a vacant lot next door to assemble a giant computer terminal. The intended message was that you can send mail easier and faster using your terminal (and MCI Mail) than via the post office. My reaction was probably typical — "okay, but I don't have any electronic addresses to send to." What really got me interested was the boast about "high quality printing." I sent the first letter back to my own address to see what kind of quality a high-speed laser printer could produce, and was absolutely amazed. The paper looks like bond paper — in fact if you hold it up against the light, you see the logo for "Capitol Bond" with "25 percent cotton content" printed underneath. A closer look reveals the truth: all four edges of the paper contain hundreds of micro-size perforations. But the mechanical engineers have done such a good job in designing the equipment to remove the tractor-feed holes, it looks like an ordinary 8x10 sheet of paper. The print itself (created by a $50,000 laser printer) is very close to "daisy wheel" quality. The giveaway comes when you flip the sheet over and look for indentations, or "typewriter periods" — there are none due to the fact that the laser never needs to touch the paper. The single-space print is a perfect black on white that's very easy to read, but a double-space option would be nice. The final product is delivered in a professional looking 8x10 orange envelope.

Using the MCI Mail network is easy, and the company has gone to the effort to print up special user instructions for Model 100 owners. The "documented procedures" go into total detail about hooking up the cable, setting the Ans/Orig. button, and setting *TELCOM* Stat parameters at "M8N1E." Unfortunately, the procedure for creating the auto-dial/auto-logon sequence for your ADRS file is wrong: you can tell there's trouble when you see procedures for 300 and 1200 baud. It's best to go back to pages 91-93 of the Model 100 Owner's Manual to bone-up on creating an auto-logon sequence. Remember to observe upper- and lowercase when selecting a prompt letter. MCI uses a lowercase 'u' for user i.d., but uppercase 'P' for password. Names and numbers have been changed to protect the innocent, but here's what I ended up with:

```
MCI (Stat) M8N1E :5465598<=^M
=^M?uDBOLE^M?PPHAROAH
^M>:
```

The beauty about using the Model 100 with MCI mail is that you can create your letter(s) beforehand in separate files, then Upload them at the proper time. Although MCI has gone to great trouble to offer primitive editing capabilities online, it's much easier to get your copy exactly right before dialing up, using the 100's own cut and paste functions. Sending a letter is this easy: Go to *TELCOM*, find MCI, press F2 to have it dial up and log on. Once you're connected, you get the following menu: SCAN, for a summary of your incoming mail; READ, to Read messages one by one; PRINT, to display messages nonstop; CREATE, to write an MCI letter; DOWJONES, to switch to the Dow Jones News/Retrieval service; ACCOUNT, to adjust the terminal display; and HELP, for assistance. With a letter all set to Upload, you just type "CREATE" then get prompted for the address you want the letter sent to. The only real requirement is that the last entry contain a zip code number. Then you'll be prompted to enter the text, and here's where the M100 really shines. Just hit F3, then after the message "File to Upload?," type the name of the file to be sent, press ENTER and wait for the final prompt for "Width?" and type 80. After the upload is finished, you see the reverse-video "Up" switch back to normal. Tell MCI you've finished by adding ENTER, a slash, and second ENTER. Then you'll get another menu, asking you to choose among four possible delivery methods: 1) within four hours, or 2) overnight, thanks to a co-op agreement with Purolator, 3) regular mail with laser printing equipment, or 4) send it to an electronic mailbox.

The cost of being on the system is nothing until you send a letter. This makes it convenient to take advantage of checking your "Inbox" without worrying about paying connect time. (EasyLink charges 30 cents a minute to do the same thing.) MCI mail has been designed to serve the lowest, dumbest terminal, and I found myself getting a little impatient waiting for the same menus to come up. But the overall organization is logical: Inbox, Outbox, Draft and so on. Deluxe services of MCI mail take advantage of their laser printer: you can register your company logo (in black and white) *and* your signature — giving a personal touch. There's also an ad-

vanced users' option where you can send and receive mail, without waiting through the various menus. Western Union should take their cue from this and do some reverse-engineering to make it easier for beginners. . . .

EasyLink : Not So Easy

The big ad blitz for MCI mail was over the past winter; now it's daily newspaper ads for "EasyLink". This is the Western Union E-mail offering that actually got a head start on MCI but has yet to match the level of personal service. A look at what EasyLink has to offer provides a good first impression: access to Mailgrams, Telegrams, Cablegrams, Telex, and the "FYI" news service — Western Union's information retrieval service. And the brochure makes it all sound . . . well, easy. But when I got my "welcome to EasyLink" letter, I had to chuckle a little about how this huge company operates. Unlike other telecommunications services that issue a password and user i.d., Western Union went them all three times better. You get six different alphanumeric codes: EasyLink Identificiation (EID), EasyLink CI Telex I number, EasyLink CI Telex answerback name, EasyLink Mailbox Number (ELN), EasyLink User Name, and, last but not least, your EasyLink Customer Account Number. If you can wade through all that (I was given a total of 51 characters in the six codes) then it's on to the 67-page looseleaf User Guide. It's so well printed and professionally done, I almost hate to criticize it, but again I found myself puzzling over the cryptic operation of the "EasyLink" system. After a lengthy logon, instead of being given English-word options like MCI's "create" or "read" you get a "PTS," which stands for Proceed to Select . . . (huh?) Believe it or not, that's the prompt to type in the address to which you want your message sent! Beware: for unexplained reasons, EasyLink won't accept the address for Mailgram, Telegram or Cablegram if there is a comma in it. Then you have to enter a "+" sign to indicate you've finished addressing, and EasyLink responds with a "GA" for Go Ahead. At that point, you can use the Model 100's Upload feature. At least, ending the session is semi-logical: type the word "QUIT," preceeded by a slash.

The real disappointment comes when you see the hard-copy letter (Mailgram) — it's printed on tractor-feed paper, with the blue "Western Union Mailgram" logo at top, and the text is standard dot matrix in all uppercase! A spokesman for EasyLink says they intend to upgrade printers to either four-color dot matrix or laser within the year. Besides charging you 30 cents a minute, a standard electronic page (2500 characters) will cost three dollars to send by Mailgram. This compares to two dollars by MCI mail (for 3500 characters) and no connect time charges. Obviously, EasyLink users are drawn more to the other services not available from MCI, like international telegrams or the ability to store an entire address file with EasyLink to send letters to thousands of people at once. For the average Joe who only wants to send a few letters, this is neither a user-friendly system nor a superior product.

> "It's a mix of new-tech computer telecommunications, satellites and advanced printers combined with the old hand-delivered methods of the postal service."

Tel-Letr: Truly Automatic Letters

Challenging giant MCI and Western Union is little Gunther International Limited in Mystic, Conn. They've taken the approach of catering directly to Model 100 users by utilizing the powerful *TELCOM* functions of the machine in a 6.5K program that is downloaded to you on sign-up day. It basically acts as "autopilot" after prompting you for text and address: depress a function key and the rest is done automatically. In fact, when the Model 100 has finished transmitting its messages, the Tel-Letr program searches for any messages waiting for you and downloads them into your 100 for later reading. Besides this automatic software feature, Gunther is also tempting Model 100 owners with a four-color correspondence-quality dot matrix printer. As will MCI, they'll digitize your logo and signature — but the logo can be in black, red, blue, green or any combination. The samples that came with the introduction package were impressive: deep, dark colors with a micro-graphics detail still unattainable from ink-jet systems. Gunther's own logo uses all four colors to produce a miniature U.S. flag and seven others across the top of the page. Another good use of color can be for things like comparison charts: for example, in a comparison of chosen features, Gunther had a whole column of red "Yes" answers when compared to the prevalent "No" answers for Mailgram, USPS E-Com, and MCI Mail. The Connecticut firm was able to be the lone standout for things like four-color printing, variable type sizes, underlining, logo capability on the envelope, and variable envelope copy. The last two capabilities are available thanks to the company's founder and inventor, Bill Gunther. He has designed a machine to do all the printing on an envelope while it's still a flat piece of paper, then automatically fold it around the printed letter to form the finished envelope. The result is a white envelope that can really stand out with a good color logo. The cost for all this is competitive with the other two — $1.75 for the first page, 75 cents for each additional page. Besides a logo on the envelope and letter itself, Gunther also promises a true-signature capability like MCI: currently, it's a generic "dummy" signature.

Re-inventing The Postal System

That was MCI's claim six months ago when the company unveiled MCI mail. Now, several other firms have staked a claim on this potentially multi-billion dollar market. Purely electronic mail led the way, hooking up desktop computers so their owners could easily communicate. But until this technology began to reach into the "real world" medium of paper, the market was limited. Now, using your Model 100 in the comfort of your own home, you can send professionally printed material just about anywhere. And with the 100's rare ability to keep multiple text files in electronic memory, you'd be well-advised to check out all three of these pushbutton letter services.

MCI Mail
2000 M St., NW
Washington, DC 20036
1-800-624-2255

Western Union EasyLink
One Lake St.
Upper Saddle River, NJ 07458
1-800-982-2737

Tel-Letr (Gunther Intl.)
P.O. Box 586
Mystic, CT 06355
1-800-225-5800

PCM

Introducing dBASE II Part I

By Danny Humphress
PCM Technical Editor

This month we begin a second major tutorial series for the Model 2000 — 'Introducing dBASE II.' As a database system, dBASE towers above the rest; we feel this series by PCM Technical Editor Danny Humphress will help you rise to its challenge and potential.

Today's business world is turning away from the filing cabinets of the past and looking toward computers as the filing system of the '80s. Electronic database software systems for microcomputers are as plentiful today as blades of grass on a golf course. Towering above all the rest in popularity is Ashton-Tate's dBASE II. While it is not the most feature loaded or easiest to use, dBASE is a pioneering piece of software. It introduced the computer world to new concepts in database management. dBASE is the *de-facto* standard to which all other database systems are compared.

Perhaps the most innovative thing about dBASE is that it goes beyond conventional database programs in that it allows one to actually write programs in its specialized language. dBASE as a language is nothing to laugh at. It is a nicely structured language with a wealth of features. Programs that may take weeks to write in BASIC, COBOL, or another application languages, can usually be done in a day or so with dBASE.

That's what this series of tutorials is going to lead to —using dBASE as a programming language. We'll assume that you have no knowledge of dBASE or any other programming language, and start at the first rung of the dBASE ladder. You'll have the opportunity for a lot of hands-on experience, so having access to dBASE II, while not necessary, will be very helpful.

Before we can learn *how* dBASE works, let's talk about

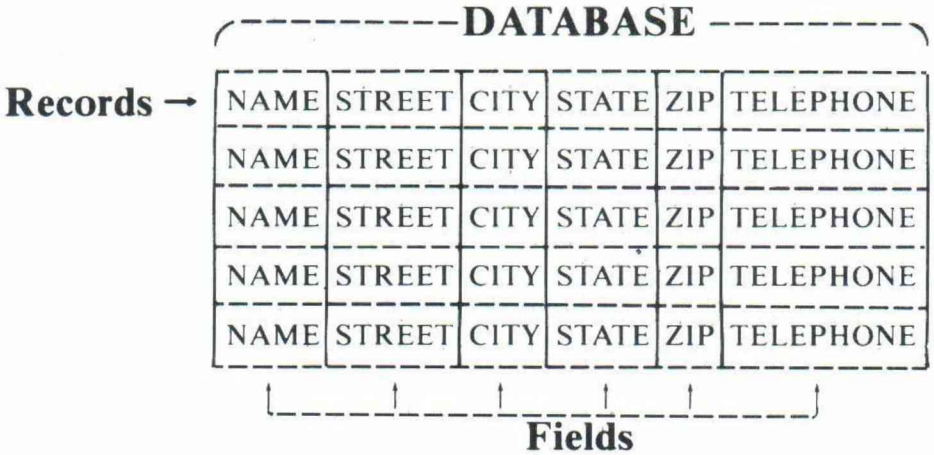
what dBASE actually does.

dBASE is a *database manager*. This simply means that it is designed for storing and retrieving records. You can think of dBASE as a smart Rolodex file. You have a file box full of cards. Each card may contain "fields" such as name, street, city, state, ZIP code, and telephone number.

When you want to find the address for, say Marla Smith, dBASE gets it for you. You can do *that* with a $10 Rolodex, you say. Maybe so, but suppose you want to send a letter to all the people in your file who live in Kentucky or Indiana. You would have to go through all the cards in your file box, pulling out only those that meet your criteria. This could turn into a major job, but it's a piece of cake for dBASE. This is just the beginning of the capabilities of dBASE.

Using this example, our Rolodex box is a "file" to dBASE. There can be an unlimited number of files on a disk, depending upon the size of the files and the storage capacity of the disk. dBASE can even work with two files at the same time. Each card in the Rolodex is a "record." dBASE can handle over 65,000 records in a single file — that's a pretty big file box!

On each of the file cards (records), we have one or more "fields." Fields define the specific information that we want to keep in each record. Name, street, city, state, ZIP code, and telephone number are the fields in this example. Each record in a dBASE file can have up to 32 fields. Our sample database would look like this:



Creating A Database File

Before you begin using dBASE as your filing system, you have to tell it what information you want to keep in your files. You give the file a name (which can be up to eight characters), and tell it the names, types, and sizes of each of the fields. This is done with dBASE's CREATE command.

Let's convert our address Rolodex file to dBASE. Put the dBASE disk in your computer and type "DBASE" from MS-DOS. There will be a short copyright message on the screen followed by a period and a cursor. The period, or "dot prompt," tells you that dBASE is awaiting your command.

We will name this file "MAIL." To create the file, type the following:

CREATE MAIL Press ENTER

If you just typed "CREATE," without the file name, dBASE would ask you for a file name.

dBASE prompts you to enter four pieces of information for each field in your database: field name, type, length, decimal places.

The field name can be up to 10 alphanumeric characters. you can also use colons (:) in your field names — handy for separating a two-word field name.

A field can have one of three types: character, numeric, or logical. Character fields can store letters, numbers, punctuation marks — anything. Numeric fields can store only digits, a decimal point, and a minus sign. Logical fields can either store a 'T' for true or an 'F' for false.

The length of a field determines how much room you'll have for entering data into this field. You would want to make the name field in our example large enough for most names, yet not overly large. If made too big, you'll be wasting storage on your disk. If you made the length 100 characters, each record would reserve 100 spaces for the name. Even if a name were very short, it would still take the same amount of space as a 100-character name.

Decimal place tells dBASE where to put a decimal, if any, in a numeric field. You would usually use a decimal place of two for dollar amounts.

We'll use the following table for our mailing list database:

FIELD NAME	TYPE	LENGTH	DECIMAL
NAME	C	35	
STREET	C	35	
CITY	C	20	
STATE	C	2	
ZIP:CODE	C	10	
TELEPHONE	C	13	
YTD:SALES	N	10	2

I've added a year-to-date sales field to our database to show you an example of a numeric field with two decimal places. Since we've allocated ten spaces for this field including two decimal places, the largest number that we could have here would be 9999999.99 (the decimal place counts as one space).

When you tell dBASE about your fields, use this format:

FIELD NAME, TYPE, LENGTH, DECIMAL

Separate each with a comma. If you don't need the decimal places, just enter the field name, type, and length —forget the last comma and decimal. After we've told dBASE to CREATE a file named "MAIL," we need to enter the field information. Enter it as follows:

NAME,C,35	Press ENTER
STREET,C,35	Press ENTER
CITY,C,20	Press ENTER
STATE,C,2	Press ENTER
ZIP:CODE,C,10	Press ENTER
TELEPHONE,C,13	Press ENTER
YTD:SALES,N,10",2"	Press ENTER
Press ENTER	

Notice the ',2' after YTD:SALES. This tells dBASE that we want two decimal places in this field.

Pressing ENTER for the seventh field instead of entering another field name tells dBASE that you are finished entering the fields.

Once you've completed this, you have created a file that is ready to receive our data and dBASE will ask you if you want to add records at this time for now say 'N' for no and you'll see another dot prompt telling you, once again, that dBASE is awaiting your next command.

Using A Database

OK, we've set up our database, now let's enter some names into it. First, we must tell dBASE which file we want to

Figure 1

```
. LIST

00001  PCM                                  9529 U.S. Highway 42                P
rospect              KY 40059      (502)228-4492     5100.50
00002  Radio Shack                          300 One Tandy Center                F
ort Worth            TX 76102                       123456.78
00003  Portable Computer Support Group      11035 Harry Hines Blvd.             D
allas                TX 75229      (214)351-0564     1000.00
00004  Computer Plus                        480 King Street                     L
ittleton             MA 01460                          2000.00
00005  B.T. Enterprises                     10 Carlough Road                    B
ohemia               NY 11716-2996                     3000.00
00006  Chattanooga Choo Choo                P.O. Box 15892                      C
hattanooga           TN 37415                          4000.00
00007  Dr. Preble's Programs                6540 Outer Loop                     L
ouisville            KY 40228                          5000.00
00008  Computer Solutions Company           901 Embassy Square Blvd.            L
ouisville            KY 40299-1814 (502)491-6122     6000.00
00009  Prickly-Pear Software                9234 E. 30th Street                 T
ucson                AZ 85710      (606)886-1505     7000.00
00010  Skyline Marketing Corp.              4510 W. Irving Park Road            C
hicago               IL 60641      (312)286-0762     8000.00
00011  Purple Computing                     2068 Ventura Blvd.                  C
amarillo             CA 93010      (805)987-4788     9000.00
00012  Spectrum Projects                    4285 Payne Avenue #9866             S
an Jose              CA 95117      (805)987-4788    10000.00
00013  Dennison                            82 Calvary Street                   W
altham               MA 02154      (800)343-8413    11000.00
00014  Traveling Software, Inc.             11050 Fifth Avenue NE               S
eattle               WA 98125      (800)343-8080    12000.00
.
```

work with. I know — we just created a new database — doesn't dBASE remember? No, it does not. We have to remind it. Once we've told it, though, it will remember which file we're using until we either leave dBASE or use another file.

This brings us to a new dBASE command, USE. Type this (at the dot prompt, of course).

USE MAIL Press ENTER

We've just told dBASE that all our subsequent commands will deal with the "MAIL" file. After pressing ENTER, we'll see our familiar dot prompt. If dBASE could not find the file on the disk (perhaps we typed it wrong), it would tell us so and give us a chance to correct it.

Appending Records

We're all ready to start adding records to our database file. This is done with the APPEND command. Type:

APPEND Press ENTER

Voila! A blank form is displayed on the screen with our field names in a column followed by white (or green) boxes for our data. Notice "Record 00001" at the top of the screen. Each record is given a number, starting with one. dBASE is telling us that this is the first record in the database.

Let's go ahead and enter a record. If you make a mistake, just use the arrow keys to move around within the white boxes and type over the boo boo. Enter the following data:

NAME	PCM
STREET	9529 U.S. Highway 42
CITY	Prospect
STATE	KY
ZIP:CODE	40059
TELEPHONE	(502) 228-4492
YTD:SALES	5100.50

When you press ENTER after typing the last field (telephone), the record is stored on the disk and a new blank form for the next record (record 2) is displayed. If we were finished entering records at this point, we would press CTRL 'Q' (hold down CTRL and press 'Q'). Telling BASE to "quit" this operation. We don't want to do that now, though; we want to enter a few more records. Enter the following records on your own.

Radio Shack
300 One Tandy Center
Fort Worth, TX 76102
(no telephone number)
123456.78

Computer Plus
480 King Street
Littleton, MA 01460
(617) 486-3193
2000.00

Chattanooga Choo Choo
P.O. Box 15892
Chattanooga, TN 37415
(615) 875-8586
4000.00

Computer Solutions Co.
901 Embassy Square Blvd.
Louisville, KY 40299-1814
(502) 491-6122
6000.00

Skyline Marketing Corp.
4510 W. Irving Park Road
Chicago, IL 60641
(312) 286-0762
8000.00

Spectrum Projects
4285 Payne Avenue #9866
San Jose, CA 95117
(212) 441-2807
10000.00

Traveling Software, Inc.
11050 Fifth Avenue NE
Seattle, WA 98125
(800) 343-8080
12000.00

Portable Computer
Support Group
11035 Harry Hines Blvd.
Dallas, TX 75229
(214) 351-0564
1000.00

B.T. Enterprises
10 Carlough Road
Bohemia, NY 11716-2996
(516) 567-8155
3000.00

Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 966-8281
5000.00

Prickly-Pear Software
9234 E. 30th Street
Tucson, AZ 85710
(606) 886-1505
7000.00

Purple Computing
2068 Ventura Blvd.
Camarillo, CA 93010
(805) 987-4788
9000.00

Dennison
82 Calvary Street
Waltham, MA 02154
(800) 343-8413
11000.00

Whew! All that typing should give you a little experience with entering

data into a dBASE file. Press CTRL 'Q' to quit appending.

LISTing A Database

Now that you've done all that work, let's take a look at what we have. The LIST command lists the contents of a database. You can be specific about which records you want to see and which fields of those records you want displayed, but for now just type:

LIST Press ENTER

The records in your database are listed in the record number order. The number on the far left of the screen is the record number. There is too much in each record to display it on a single line on the screen, so dBASE continues the record on a second line.

See Figure 1.

Suppose we just want to list the names and the year-to-date sales. Enter:

LIST NAME,YTD:SALES Press ENTER

This tells dBASE to display only the name and year-to-date sales fields for each record.

See Figure 2.

Now suppose that we want a list of names that have year-to-date sales greater than 5000. Type the following on one line:

LIST NAME,YTD:SALES
FOR YTD:
SALES > 5000
Press ENTER

Figure 2

```
. LIST NAME,YTD:SALES

00001   PCM                                5100.50
00002   Radio Shack                      123456.78
00003   Portable Computer Support Group    1000.00
00004   Computer Plus                      2000.00
00005   B.T. Enterprises                   3000.00
00006   Chattanooga Choo Choo              4000.00
00007   Dr. Preble's Programs              5000.00
00008   Computer Solutions Company         6000.00
00009   Prickly-Pear Software              7000.00
00010   Skyline Marketing Corp.            8000.00
00011   Purple Computing                   9000.00
00012   Spectrum Projects                 10000.00
00013   Dennison                          11000.00
00014   Traveling Software, Inc.          12000.00
.
```

We've told dBASE to list the name and amount only for those that are greater than (">") 5000.

See Figure 3.

Finally, we want a list of those located in Kentucky with year-to-date sales of less than 7000. Type the following on one line:

LIST NAME,YTD:SALES
FOR YTD:SALES < 7000
.AND. STATE="KY"
Press ENTER

The ".AND." is an example of a "boolean" or "logical" operator. The record will only be displayed if the first *and* the second conditions are true. Another example of a boolean operator is ".OR.". As I am sure you can logically figure, .OR. would work only if either the first *or* the second conditions were true. See what happens if you substitute .OR. for .AND. in the previous command. Figure 4 shows the results of the .AND. example.

Finally for this month, a very important command, QUIT. When we're through dBASEing, we need to exit it properly to insure that our database file is properly closed. dBASE will return you to MS-DOS. At the dopt prompt, type:

QUIT Press ENTER

You're just beginning to see the power and versatility of dBASE II with only a few commands. There are many more commands that do things like edit a record, print a report, sort a file, globally update a file, and even a command to let you change the color of the screen and characters. And this is merely the beginning. When you incorporate these commands into a "command file," which we will be doing in future encounters with dBASE, you can create programs that really make your "Rolodex" come to life.

Unitl next month, do some experimenting on your own with our sample database file. Try doing some fancy *LISTs* using ".AND." and ".OR." (try combinations of both on the same line). Add some more records, if you like, but don't erase what you've entered today — we'll want to use the same file next month when we'll learn about how to edit records and two different ways of sorting our database.

PCM

Figure 3

```
. LIST NAME,YTD:SALES FOR YTD:SALES>5000

00001   PCM                                5100.50
00002   Radio Shack                      123456.78
00008   Computer Solutions Company         6000.00
00009   Prickly-Pear Software              7000.00
00010   Skyline Marketing Corp.            8000.00
00011   Purple Computing                   9000.00
00012   Spectrum Projects                 10000.00
00013   Dennison                          11000.00
00014   Traveling Software, Inc.          12000.00
.
```

Figure 4

```
. LIST NAME,YTD:SALES FOR YTD:SALES<7000 .AND. STATE="KY"

00001   PCM                                5100.50
00007   Dr. Preble's Programs              5000.00
00008   Computer Solutions Company         6000.00
.
```

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3M

Whether you play by the American or the English system, this version of Poker Solitaire is not only a lot of fun, it's a . . .

Square Deal

By Rick Rothstein

Games make computers fun to use. Although an argument can be made that the Model 100 is already a fun computer to use, it is not an exception to this rule. However, the small screen size and directional viewing requirement of its LCD display generally limit the types of games that can be played to either the operator-vs-computer or the solitaire kind. *Square Deal* is a game that belongs to this latter category.

Square Deal is modeled after a challenging solitaire card game called, simply enough, Poker Solitaire. In that game a deck of cards is thoroughly shuffled and 25 cards are turned up from the pack one at a time, and placed to best advantage into a square grid. The object is to score as many points as possible with the 10 poker hands formed by these five rows and five columns.

Scoring

There are two recognized methods of scoring this game. One is called the American system, which evaluates the hands based on their odds of occurring in a regular poker game. The other method is called the English system and it evaluates hands based on their difficulty in being formed while playing this particular solitaire game. (See Table 1 for a breakdown of these two scoring methods.)

If you score more than 200 points in the American system, or more than 70 points in the English system, then you can consider yourself as having "won" the game. It is no easy feat to score this many points; but you shouldn't mind, in as much as the game is very addicting.

Playing The Game

Of course, the Model 100 will take care of shuffling, dealing and scoring for you. When you first RUN the program, the screen will clear, a five-by-five grid of empty squares (actually, they are rectangles) will be displayed on the left while the first card to be played is shown on the right. Simply move the blinking cursor to the empty space into which you wish to play this card and press ENTER to lock it into place. (Once played, a card cannot be removed from the grid — so plan carefully.) A new card will now be displayed on the right for insertion into the grid. After the 24th card is played, the 25th will automatically be entered into the remaining unfilled square for you.

In addition to being able to move the cursor around the grid with the four dedicated arrow keys, *Square Deal* has implemented two additional, diamond-patterned directional key controls. The keys 'S', 'D', 'E' and 'X', keys 'K', 'L' and 'O', will also move the cursor left, right, up and down respectively. You may use any one of these keys for moving the cursor — your choice.

All cursor movements are auto-repeating; that is, holding down any of the directional control keys will continue to move the cursor until released. In addition, the cursor is designed to skip over any cards that have already been played. Because of this, the cursor's movements are implemented as follows:

1) RIGHT DIRECTIONAL KEY — moves the cursor from left to right, dropping to the beginning of the next row down when the end of the current row is reached;
2) DOWN DIRECTIONAL KEY — immediately drops cursor down to the beginning of the next row.
3) LEFT DIRECTIONAL KEY — moves the cursor from right to left, moving up to the end of the

---

(Rick Rothstein, who lives and works in Trenton, N.J., has been working with computers for four years. Several of his programs have been successfully marketed commercially.)

preceding row when the beginning of the current row is reached;
4) UP DIRECTIONAL KEY — immediately raises cursor to the end of the preceding row.

Once the last card has been entered into the grid, the program will signal that it is scoring the game. At the end of approximately six seconds, both the American and English version scores will be displayed. Pressing any key will then replace the displayed scores with an option menu. (The filled-in grid will remain visible throughout.) Your choices will be as follows:

1) Start a new game with a freshly shuffled deck;
2) Replay the same 25 cards in the same order of presentation — this will allow you to challenge a friend to beat your score, or allow you to replay the last game for a better score;
3) Redisplay the American and English versions of your score;
4) Display the names of the 10 poker hands that have been formed.

You may end the game at any time by pressing DEL.

About This Program

Since it would require a "book" to describe the circuitous — yes, even tortuous — combination of commands that serve as my program logic, I will not even attempt to explain *Square Deal* in detail. However, there are a few points about the program which should be discussed.

First, the listing is shown with blank spaces separating most keywords. This was done to make it easier for you to read the listing. I would suggest, however, that these spaces be omitted when you actually type the program in — they take up valuable RAM, slow down program execution and are simply not needed to make the program run. (If your Model 100 only has 8K of memory, then the blank spaces *must* be left out in order to fit the program in.)

I would also like to draw special attention to Line 832 in the program listing. A rather long string constant is included as part of the MID$ command. There are four spaces after the word PAIR, one space after the number 2, one after the word PAIRS, two after 3/KIND, three after STRAIGHTFLUSH, and two more after 4/KIND. These spaces are important if you wish the option which displays the names of the poker hands to work properly.

In Lines 530 and 61000 of the program listing, you will find the command POKE 65450,0. The purpose of this poke is to nullify the type-ahead feature which is always active on the Model 100. Poking a zero into this memory location tells the computer that there are no more keystrokes stored in the type-ahead buffer — even if there are. Hence, any spurious or unintended keystrokes entered prior to this poke will be ignored by the subsequent INKEY$ function. (This poke should *not* be made part of the direct keyboard reading loop, but rather be performed once prior to each keystroke being read —see Lines 61000 and 61010.)

The final thing I wish to discuss concerns random numbers. Line 110 implements the "standard" method of randomizing the Model 100's random number generator. This line, in and by itself, is not sufficient for a game like *Square Deal*. That's because the sequence might still be predictable. For example, if the number of seconds determined by Line 110 is "two" the first time the program is RUN and, say, "10" the second time it is

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RUN, then these two games will share 17 of the *same* cards, dealt in exactly the same order. After a while, you might start to remember and recognize the various patterns. So, in Line 550, I have added an additional randomizer. Line 550 is a more complex implementation of the standard keyboard input routine which is generally written as 100 K$= INKEY$: IF K$="" THEN 100 where the line number was selected for example purposes only. As long as no key is pressed, this line would continue to loop back onto itself. Only when a key is pressed will the loop be broken. If we simply add a statement to read a random number for each loop, say, 100 W= RND(1) : K$=INKEY$:IF K$= "" THEN 100 then the next random number to be used by the program will depend upon when the user presses a key on the keyboard — a time lapse that will vary from game to game and from user to user.

Table 1. Scoring For *Square Deal*

HAND	English	American
Royal Flush	30	100
Straight Flush	30	75
Four Of A Kind	16	50
Full House	10	25
Flush	5	20
Straight	12	15
Three Of A Kind	6	10
Two Pairs	3	5
One Pair	1	2

PCM BAR CODED LISTING

The listing:

```
1 REM  SQUARE DEAL
2 REM  BY
3 REM  RICK ROTHSTEIN
4 REM  TRENTON, NEW JERSEY
100 DEFINT A-Z:DIM D(52),P(25),S(25),G$(
2),H$(2,5)
110 FOR N=1 TO VAL(RIGHT$(TIME$,2)):W=RN
D(1):NEXT
120 CLS:FOR N=0 TO 2:G$(N)=STRING$(25,48
):NEXT
130 FOR X=14 TO 98 STEP 21:FOR Y=0 TO 52
 STEP 13:LINE(X,Y)-(X+19,Y+11),1,B:NEXT:
NEXT
140 IF F=0 THEN FOR N=1 TO 52:D(N)=N-1:N
EXT:D=53
150 PRINT @62,"PLEASE PLAY":PRINT @103,"
THIS CARD":LINE(153,27)-(176,40),1,B:LIN
E(154,28)-(175,39),1,B
500 FOR N=1 TO 25:X=157:Y=30:IF F<>0 THE
N 520
510 D=D-1:M=D*RND(1)+1
515 P(N)=1+(D(M) MOD 13):S(N)=D(M)/13:D(
M)=D(D)
520 C$=CHR$(13*S(N)+P(N)+64):GOSUB 50000
:GOSUB 60000:Z=1:G=0:GOSUB 39000
530 V=1:GOSUB 40000:POKE 65450,0
540 B=0:LINE(X,Y)-(X+15,Y+7),V,BF
550 B=B+1:IF B=12 THEN V=1-V:GOTO 540 EL
SE K$=INKEY$:IF N=25 THEN K$=CHR$(13):GO
TO 600 ELSE IF K$="" THEN W=RND(1):GOTO
550
600 IF K$=CHR$(13) THEN GOSUB 40000:GOSU
B 50000:GOSUB 60000:MID$(G$(0),31-C-5*R)
=C$:MID$(G$(1),C+5*R-5)=C$:MID$(G$(2),R+
5*C-5)=C$:NEXT:GOTO 700
610 IF INSTR(CHR$(28)+"dDlL",K$)=0 THEN
620
615 GOSUB 50000:Z=1:GOSUB 39000:IF G=0 T
HEN GOSUB 39000:GOTO 530 ELSE 530
620 IF INSTR(CHR$(29)+"sSkK",K$)=0 THEN
640
625 GOSUB 50000:Z=0:G=26-G:GOSUB 39000:I
F G=0 THEN GOSUB 39000
630 G=26-G:R=6-R:C=6-C:Z=1:GOTO 530
640 IF INSTR(CHR$(30)+"eEoO",K$) THEN G=
G-(G MOD 5)-(G MOD 5<>0)+4*(G MOD 5=0):G
OTO 625
645 IF INSTR(CHR$(31)+"xX,",K$) THEN G=G
-(G MOD 5)-5*(G MOD 5<>0):GOTO 615
650 IF K$=CHR$(127) THEN 10000 ELSE BEEP
:GOTO 540
700 F=0:PRINT @61,SPACE$(12):PRINT @102,
"SCORING...."
710 U=0:T=0:FOR N=1 TO 21 STEP 5:FOR L=1
 TO 2:F$="":H$=STRING$(13,48):S=0:J=0
720 FOR K=0 TO 4:P=ASC(MID$(G$(L),N+K,1)
)-65:F$=F$+RIGHT$(STR$(INT(P/13)),1)
725 P=(P+1) MOD 13:P=P-13*(P=0):MID$(H$,
P)=MID$(STR$(1+VAL(MID$(H$,P,1))),2,2):N
EXT
730 IF F$=STRING$(5,ASC(F$)) THEN J=1
740 H=INSTR(H$,"1"):IF H>0 AND INSTR(H+1
,H$,"1111")=H+1 THEN S=1
750 IF INSTR(10,H$,"1111")>0 AND ASC(H$)
=49 THEN S=2
760 IF J=1 AND S>0 THEN E=30:A=75-25*(S=
2):GOTO 830
770 IF J=1 OR S>0 THEN E=-5*(J=1)-12*(S>
0):A=-20*(J=1)-15*(S>0):GOTO 830
780 IF INSTR(H$,"4") THEN E=16:A=50:GOTO
 830
790 IF INSTR(H$,"3")>0 AND INSTR(H$,"2")
>0 THEN E=10:A=25:GOTO 830
800 IF INSTR(H$,"3") THEN E=6:A=10:GOTO
830
810 P=INSTR(H$,"2"):IF P>0 AND INSTR(P+1
,H$,"2")>0 THEN E=3:A=5:GOTO 830
820 E=-(P>0):A=-2*(P>0)
830 IF A<25 THEN Q=A/5+1-9*(A=0) ELSE Q=
A/25+5
832 H$(L,(N+4)/5)=MID$("PAIR    2 PAIRS
3/KIND  STRAIGHTFLUSH   FL/HOUSE4/KIND
ST/FLUSHROYAL/FLNOTHING",8*Q-7,8)
835 U=U+E:T=T+A:NEXT:NEXT
840 GOSUB 15000:PRINT @66,"SCORES":LINE(
153,5)-(193,17),1,B:LINE(152,4)-(194,18)
,1,B
850 PRINT @143,"AMERICAN =";T:PRINT @223
,"ENGLISH =";U:GOSUB 61000:GOSUB 15000
```

```
870 PRINT @62,"PRESS FOR":PRINT @144,"1
  NEW DEAL":LINE(131,17)-(161,17):LINE(1
67,17)-(185,17)
880 PRINT @184,"2   SAME DEAL":PRINT @22
4,"3   SCORES":PRINT @264,"4   HANDS"
890 GOSUB 61000:IF K$<"1" OR K$>"4" THEN
 BEEP:GOTO 890
900 ON ASC(K$)-48 GOTO 120,1000,840,4000
1000 F=1:GOTO 120
4000 GOSUB 15000:PRINT @63,"ROW       COL
UMN":PRINT @101,"--------  --------"
4010 FOR N=1 TO 5:PRINT @101+40*N,H$(1,N
);:PRINT @111+40*N,H$(2,N);:NEXT
4020 GOSUB 61000:GOSUB 15000:GOTO 870
10000 CLS:PRINT @135,"GAME  OVER":PRINT:
PRINT:END
15000 FOR N=20 TO 300 STEP 40:PRINT @N,S
PACE$(19);:NEXT:RETURN
20000 LINE(X,Y+7)-(X,Y+3):LINE-(X+2,Y+1)
:LINE-(X+4,Y+3):LINE-(X+4,Y+7):LINE(X+1,
Y+5)-(X+3,Y+5):RETURN
20010 GOSUB 25000:LINE-(X+2,Y+5):LINE-(X
+1,Y+5):LINE-(X,Y+6):LINE-(X,Y+7):LINE-(
X+4,Y+7):RETURN
20020 GOSUB 25000:LINE(X+2,Y+4)-(X+3,Y+4
):LINE-(X+4,Y+5):LINE-(X+4,Y+6):LINE-(X+
3,Y+7):LINE-(X+1,Y+7):PSET(X,Y+6):RETURN
20030 LINE(X+3,Y+7)-(X+3,Y+1):LINE-(X,Y+
4):LINE-(X,Y+5):LINE-(X+4,Y+5):RETURN
```


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```
20040 LINE(X+4,Y+1)-(X,Y+1):LINE-(X,Y+3)
:LINE-(X+3,Y+3):LINE-(X+4,Y+4):LINE-(X+4
,Y+6):LINE-(X+3,Y+7):LINE-(X+1,Y+7):PSET
(X,Y+6):RETURN
20050 LINE(X+3,Y+1)-(X+2,Y+1):LINE-(X,Y+
3):LINE-(X,Y+6):LINE-(X+1,Y+7):LINE-(X+3
,Y+7):LINE-(X+4,Y+6):LINE-(X+4,Y+5):LINE
-(X+3,Y+4):LINE-(X+1,Y+4):RETURN
20060 PSET(X,Y+2):LINE(X,Y+1)-(X+4,Y+1):
LINE-(X+4,Y+2):LINE-(X+2,Y+4):LINE-(X+2,
Y+7):RETURN
20070 PSET(X,Y+3):GOSUB 25000:LINE-(X+3,
Y+4):LINE-(X+1,Y+4):LINE-(X,Y+5):LINE-(X
,Y+6):LINE-(X+1,Y+7):LINE-(X+3,Y+7):LINE
-(X+4,Y+6):PSET(X+4,Y+5):RETURN
20080 LINE(X+1,Y+4)-(X+3,Y+4):PSET(X,Y+3
):GOSUB 25000:LINE-(X+4,Y+5):LINE-(X+2,Y
+7):PSET(X+1,Y+7):RETURN
20090 FOR XA=0 TO 4 STEP 2:LINE(X+XA,Y+1
)-(X+XA,Y+7):NEXT:PSET(X+3,Y+1):PSET(X+3
,Y+7):RETURN
20100 LINE(X+2,Y+1)-(X+4,Y+1):LINE(X+3,Y
+2)-(X+3,Y+6):LINE-(X+2,Y+7):LINE-(X+1,Y
+7):LINE(X,Y+6)-(X,Y+5):RETURN
20110 GOSUB 25000:LINE-(X+4,Y+5):LINE-(X
+2,Y+7):LINE-(X+1,Y+7):LINE-(X,Y+6):LINE
-(X,Y+3):LINE(X+2,Y+5)-(X+4,Y+7):RETURN
20120 LINE(X,Y+1)-(X,Y+7):LINE(X+4,Y+1)-
(X+1,Y+4):LINE-(X+4,Y+7):RETURN
25000 LINE(X,Y+2)-(X+1,Y+1):LINE-(X+3,Y+
1):LINE-(X+4,Y+2):LINE-(X+4,Y+3):RETURN
30000 DATA 4,5,3,6,2,6,1,5,0,7,1,5,2,6,3
,6,4,5
30010 DATA 1,3,0,4,0,5,1,6,2,7,1,6,0,5,0
,4,1,3
30020 DATA -2,-2,4,4,3,5,2,6,1,7,2,6,3,5
,4,4,-2,-2
30030 DATA 4,5,3,6,1,6,0,5,0,7,0,5,1,6,3
,6,4,5
39000 G=INSTR(G+1,G$(Z),"0")
39010 C=((G-1) MOD 5)+1:R=(G-1)/5+1:RETU
RN
40000 X=21*C-5:Y=13*R-11:RETURN
50000 LINE(X,Y)-(X+15,Y+7),0,BF:RETURN
60000 ON P(N) GOSUB 20000,20010,20020,20
030,20040,20050,20060,20070,20080,20090,
20100,20110,20120
60010 IF S(N)=0 THEN RESTORE 30000 ELSE
IF S(N)=1 THEN RESTORE 30010 ELSE IF S(N
)=2 THEN RESTORE 30020 ELSE RESTORE 3003
0
60020 FOR XA=7 TO 15:READ YA,YB:LINE(X+X
A,Y+YA)-(X+XA,Y+YB):NEXT:IF S(N)=3 THEN
PRESET(X+9,Y+2):PRESET(X+10,Y+3):PRESET(
X+12,Y+3):PRESET(X+13,Y+2)
60030 RETURN
61000 POKE 65450,0
61010 K$=INKEY$:IF K$="" THEN 61010 ELSE
 IF K$=CHR$(127) THEN 10000 ELSE RETURN
```

PCM

Comparison Shopping In the Electronic Malls

By Randy Graham

Last month, I described CompuServe Information Service, using the analogy of roaming around a shopping mall. How many of you tried it? Did you log on successfully? Did you find and join the M100 SIG? Have you been exploring their public access library? Have you downloaded a weather map? Did you find the program for the grandfather clock? (That's one of my favorite programs for the PoCo.) It takes up 3000 bytes of my precious RAM, but I love to show it to my friends and tell them that this is what high tech has been working toward all these years.

OK, time to visit another shopping mall — The Source. Like all malls, it has some familiar services and some unique ones. I must admit that I am still just a tourist here myself. I have been hanging around CompuServe for years and had heard that The Source was similar. For the sake of completeness and fairness, I took some of my hard-earned bucks and joined The Source. Let me take you by the hand and show you what I have discovered so far, and then let's do a little comparison shopping.

(Randy Graham is a rehabilitation counselor working with the handicapped. Personal computing is his hobby; telecommunications one of his favorite activities. He has done freelance information retrieval and is an inveterate user of the major online systems.)

Costs

The first thing I found out is that The Source is more expensive than CompuServe — or is it? Remember I told you that CompuServe costs $20 to join if you did not get it free with a modem or cord? Well, the Source costs $100 to subscribe. They also give free signups with some modems; I considered buying one and selling the modem for half price. But when I called their toll-free number, the customer support person told me that they were having a sale and so it only cost me $60. Then, I received a notice that they are running a special until the end of May, that if I get a new subscriber, it only costs him $29.95 and I get $20 worth of connect time. Now, if you will all send me your names and addresses . . . Competition, or good management or something seems to be at work here. At CompuServe, you get a slim users guide and the invitation to buy more. I have invested in several because you need them. The source gave me a big thick manual and a couple of brief handy guides. My first conclusion from the comparison is that the costs of the two services are roughly comparable.

Once you have an account, you are billed for each minute you are connected to the service. CompuServe used to charge $5 an hour for evenings and weekends with no daytime access. Last year, they went up to $6 per hour. The Source charges $7.75. CompuServe adds a surcharge for some of their databases; I have found no surcharges yet on The Source. CompuServe charges $12.50 an hour for daytime use; The Source $20.75. Both charge about double for 1200 Baud, but you are sending and receiving about four times as fast. Again, depending on your use, costs are comparable enough not to be the biggest factor in choosing.

One distinct difference is that while CompuServe has no minimum, The Source charges a minimum of $10 — $1 of which is for storage. They charge 50 cents per month per "record" of personal account storage — your personal files. A record is 2K, so that you are charged for 4K. CompuServe gives you 128K with your account and then charges you $4 per week for each additional 64K.

Now, I consider this minimum charge a significant difference in the costs of the two services. If you do not use your

CompuServe account, it costs you nothing; it will cost you on The Source.

Services

To get a handle on all the features in this "mall," let's group them into categories: information databases, computing and communicating.

Information Databases

The Source has a lot of databases on which you can read information on a great variety of topics for news and sports to home management to entertainment to stocks and bonds. What you do mostly is read. Reading these files is a lot like reading a newspaper or magazine — there is a lot of information, searchable online and very current. If you would rather read a scrolling screen than a printed page, you may enjoy this section.

Computing

This section allows you to use the various languages to process data. There are a number of utilities for data handling and text editing. There are also utilities for manipulating stock market data available from the information databases. Using their utilities can make sense if you only need them occasionally. Why not have your files on The Source and work them over there instead of investing in a lot of software which will sit on the shelf most of the time?

Communications

The scope and variety of this part of The Source is what really fascinates me. You can send Email to other subscribers. You can also send Email to multiple subscribers on your customized mailing list. You can send open or blind copies to others. You can forward an Email letter to another subscriber with your appended comment.

A capability familiar to many old system users is "Chat" which allows you to talk "live" to other subscribers. You type "ONLINE" and get a list of others who are on the system now. You recognize my ID number and type "CHAT BCF042". A line flashes on my screen "SCA123 want to chat." By typing CHAT SCA123 and my comment, I can get a conversation going. If you are busy and do not want to be interupted, you can type "Chat -OFF."

There is also a bulletin board for wide-ranging, slower-motion communication. They only have one board, but it is divided into sections and you can search only the section you want. Messages are cleared off the board after seven days to keep the size of the board within reason.

Conferencing

And then there is conferencing. This is such an important activity, it deserves its own section.

When we get to conferencing, The Source shows its real power. Anybody can join the conference. This is not a realtime interchange, and there is more than one going at a time. This is more like a topical bulletin board. Someone starts a conference and leaves a startup message. Others add their comments. You may find a message addressed to you in your "In-Box" or you may want to read all of what is going on. Some of the members get off on a specialized area and decide to start their own subconference. Whenever you log on, check to see what is going on and add your two cents worth. Other members will read it when they log on. And so it goes.

I have not really had a chance yet to check out the conferences and see if there is one on PoCos. If not, let's start one. One of the things we can decide is whether to let anyone join or keep it private. We don't want any Apple people messing around in our conference, do we? But, let's let the NECies in — they are close cousins to us PoCoers. You can make a conference private by giving the list of names or IDs who are allowed access or by establishing a

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password — not your system password, one for the conference — to restrict access.

That gets me into a fascinating aspect of The Source — what they call their "Business Services." This is mostly a packaging of the various services with the added security of closed files and closed conferences. You can set up your own telecommunications system for your company within the structure of The Source. This would seem like a dandy idea for smaller companies who are not ready for their own nationwide systems or for departments who are having trouble getting time on the company's big machine. If you have been trying to persuade your company to let you use your PoCo when you travel, why not try it out with The Source's facilities to prove its value?

Publishing

A word must be said about The Source's publishing program. They have a public access library for subscribers' use. Now, you have your own file storage capability and you can decide whether to have them open to others or closed for private use. Or, you can submit programs to The Source for publication. If accepted, they are placed in the library. The library programs are still free to subscribers, but you do not have to donate them to the general public. The Source pays you a little royalty for them. Say you have a program which takes 5 minutes to download. And say 120 people access it. That is 600 minutes or 10 hours of connect time for which The Source made $77.50 in connect charges. They will pay you a little royalty (in free time) for getting people to use their service. Very neat.

Comparison Shopping

OK, let's get brave and try to compare these two similar information services, being fair to both.

1) We have already looked at costs. CompuServe is somewhat less expensive and has no minimum charge, but the difference is not as great as I once thought. You will have to look at your own budget and decide how important price is.

2) CompuServe is friendlier to your PoCo than The Source. CompuServe's new DEFAULT program allows you to tailor the output to your screen size. There is no such utility on The Source. You will have to learn to use the control characters to stop and start the display. CompuServe normally sends a 32-column by 24-line page; The Source uses 64 x 24. I have previously advised you to hook up your printer and "ECHO" hard copy but this cuts down on portability. Dumping to disk is another option, if you have gone this route — but this is not an easy routine. When really computing portably, it looks like you are going to do a lot of repeating on The Source. Remember to use your DOWNLOAD judiciously; free memory is definitely a finite capacity.

3) The Source seems to have more information databases. If you like to read, you will enjoy the variety of their offerings. Both have computing power and utility programs at your fingertips.

"Reading these files is a lot like reading a newspaper or magazine —there is a lot of information, searchable online and very current."

4) Communications seems to be a standoff. CompuServe offers Special Interest Groups (SIGS) set up by the company in response to user demand. Each SIG is run by a SYSOP chosen by CompuServe. Each SIG has its own bulletin board, library of programs and files, and a conferencing capability. These conferences are in real time as a bunch of people get online at the same time and "talk" about a planned topic.

The Source's conferencing facility seems to include some of the above except that conferences are entirely user-run. Anyone can set up a conference at any time. As noted, the discussions do not run in real time. Another interesting aspect of The Source's conference is that the fellow who sets one up is responsible for the storage costs generated by the conference!

The Source's real-time communication is their "CHAT" program. This is one-to-one and a lot of friendships reportedly develop through CHATting. CompuServe has its unique "CB Simulator" which allows multiple-member conversations on trivial subjects in real time.

As noted, both have Email for personal private communication between members. The Source allows multiple copies and also allows you to leave read messages on the board. On CompuServe, you can only send to one recipient, although the message is still in the buffer if you want to address it to another user, etc. CompuServe does require you to file or delete a message when read. When you log on to CompuServe, a message line tells you that you have mail waiting; The Source does not. When you access a SIG on CompuServe, you are told that there is a message waiting; when you check into PARTICIPATE on The Source, you are told that there are "nn" messages in your "IN-BOX."

A strong point for The Source's conferences is that you can close them for private use of a designated group. CompuServe's SIGS are open to all users. Everyone can get into the realtime conferences, read your messages on the bulletin board and join in the CB discussions. Only personal files and Email are completely private.

5) Both systems have menu guidance for newcomers and command modes for the oldtimers. CompuServe arranges its files and programs by sections and "pages." The experienced user can take a shortcut at any system prompt ("!") by entering "GO PCS-154" or "GO 154" if you are in the PCS section, or "GO EMA" or "GO TRS" to read Radio Shack's newsletter, etc. In The Source, you type the program name "READ MAILCK" from the command prompt ("->"). On CompuServe, "T" at any system prompt will take you back to the main menu; on The Source, "Q" (or "QUIT") will get you out of whatever you are in and "M" (or "MENU") will give you the main menu.

OK, enough of this beating around the bush — which is the best buy? I thought I knew until I checked them out side by side! I think any PoCo owner who got a free packet when he/she bought a modem cord is crazy not to subscribe to CompuServe; it costs you nothing unless you use it. I would have to stop and think about The Source — will I use it enough to justify its cost? Now that I have subscribed, I am sure I will always use my minimum and get involved in some conferences, etc. How about you?

Meanwhile . . .

I haven't been hearing from you! Drop me an Email at 70015,434 on CompuServe or BCF042 (that's a zero, not the letter 'O') on The Source. Let's get something going here. PCM

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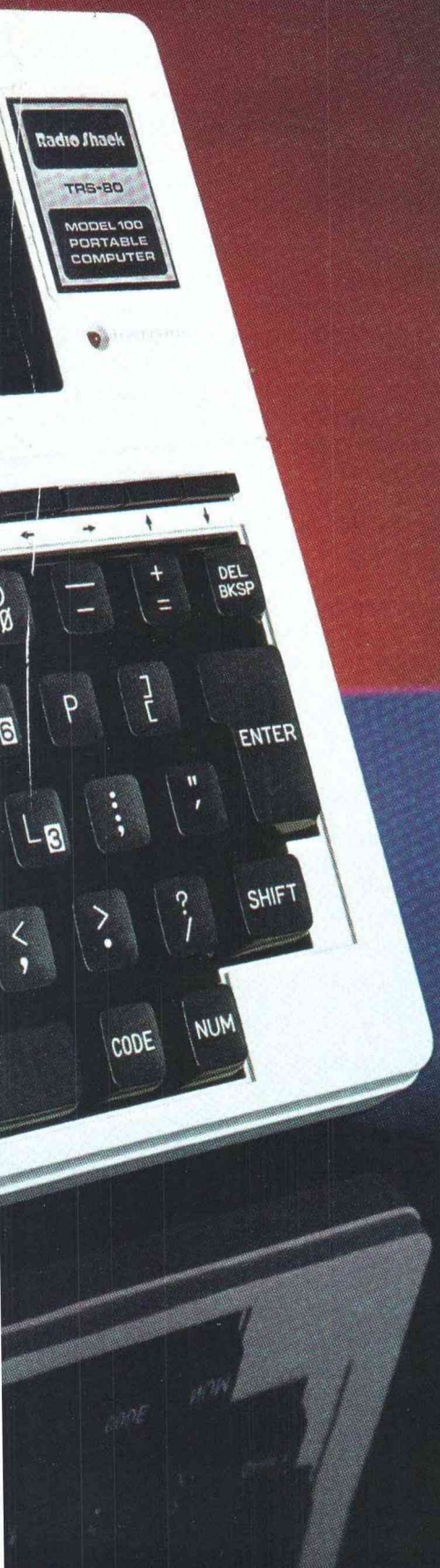

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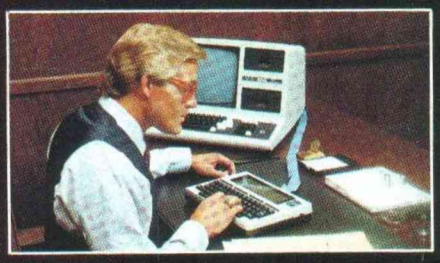

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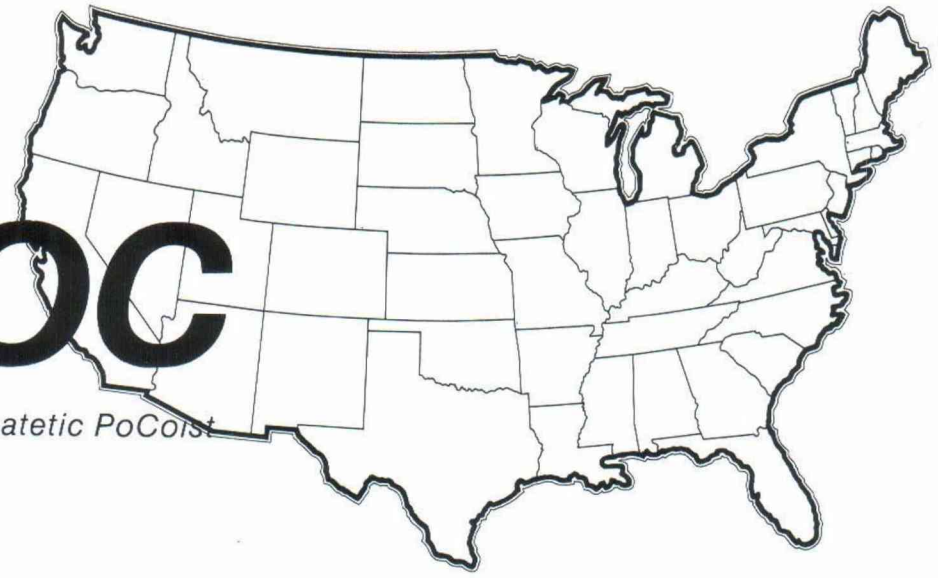

NAVLOC

A navigation locator for the peripatetic PoCoist

By Nathaniel Ireland

Many of the new solar, lunar and astronomical programs becoming available now for the Model 100 require a latitude and longitude input. Because the Model 100 is a portable machine and moves about frequently, the reference where this information is available is seldom accessible. With a road map and the *NAVLOC* program, the latitude and longitude of any location within the continental United States below 50 degrees north latitude can be determined easily, usually within one degree (+/- 30 minutes).

(Nathaniel Ireland, now a retired gentleman farmer, was an engineer in the electronics industry for many years. In addition to his agricultural hobby, he finds time to enjoy his computers and do some consulting work.)

Type the program as in Listing 1 and SAVE it to RAM before RUNning. Be especially careful when typing the LINE and DATA statements as a small typing error here can spoil the graphics display.

When *NAVLOC* is RUN, an outline map of the United States with most of the state boundaries is drawn and the program title and commands appear to the right of the map. Note the blinking pixel off the coast of North Carolina. This blinking pixel can be moved anywhere on the map using the arrow keys. When the blinking pixel crosses a boundary, there will remain a hole in the boundary. The map can be redrawn at any time by pressing the 'R' key to repair the boundaries. The blinking pixel will be placed at its last location.

Press the 'L' key to display the latitude and longitude which the location of the blinking pixel represents. The program has a printer option which is activated by pressing the 'P' key.

Press the 'E' key to end the program.

The listing:

```
10 CLS:H=114:V=31
20 REM *NAVLOC* by Nat Ireland - Jan '84
30 GOSUB500:REM DRAW LINE STATEMENTS
40 READH1:IFH1=999THEN50:ELSEREADV1:PSET
(H1,V1):GOTO40:REM DRAW DATA STATEMENTS
50 PRINT@27,"* NAVLOC *":PRINT@65," ":PR
INT@105,"ARROWS TO MOVE":PRINT@148,"<L>o
cate":PRINT@188,"<R>edraw":PRINT@229,"<E
>nd"
100 REM MOVE CURSOR AND INPUTS
110 PSET(H,V)
120 A$=INKEY$
130 IFA$=CHR$(28)ANDH<130THENPRESET(H,V)
:H=H+1:PRINT@280,SPACE$(38);:BL=0:BG=0
140 IFA$=CHR$(29)ANDH>0THENPRESET(H,V):H
=H-1:PRINT@280,SPACE$(38);:BL=0:BG=0
150 IFA$=CHR$(30)ANDV>0THENPRESET(H,V):V
=V-1:PRINT@280,SPACE$(38);:BL=0:BG=0
160 IFA$=CHR$(31)ANDV<52THENPRESET(H,V):
V=V+1:PRINT@280,SPACE$(38);:BL=0:BG=0
165 IFA$="E"ORA$="e"THENMENU
170 IFA$="L"ORA$="l"THEN200
175 IFA$="R"ORA$="r"THENRESTORE:CLS:GOTO
30
180 IFBL<10THENBL=BL+1:GOTO110
185 IFBL=10THENBG=BG+1:IFBG<10THENPRESET
(H,V):GOTO120:ELSEBG=0:BL=0:GOTO110
200 HA=130-(.5*H):HB=FIX(HA):M1=FIX((HA-
HB)*60):LA$=STR$(HB)+" DEG,"+STR$(M1)+"'
 ":PRINT@280,"W/LONG:";LA$;:VA=50-(.5*V)
:VB=FIX(VA):M2=FIX((VA-VB)*60):LO$=STR$(
VB)+" DEG,"+STR$(M2)+"'":PRINT"N/LAT:";L
O$;:GOTO110
500 REM LINE STATEMENTS
510 LINE(13,1)-(71,1):LINE(11,2)-(11,22)
:LINE(12,9)-(24,9):LINE(12,18)-(37,18):L
INE(20,18)-(20,23):LINE(25,2)-(25,17):LI
NE(37,11)-(50,11):LINE(37,12)-(37,17):LI
NE(51,2)-(51,18):LINE(37,19)-(54,19):LIN
E(32,19)-(32,27):LINE(31,28)-(31,35)
520 LINE(25,36)-(31,36):LINE(33,26)-(70,
26):LINE(41,20)-(41,37):LINE(32,37)-(36,
37):LINE(37,38)-(43,38):LINE(43,37)-(46,
37):LINE(47,36)-(52,36):LINE(52,27)-(52,
35):LINE(53,28)-(60,28):LINE(60,29)-(60,
32):LINE(60,33)-(70,33):LINE(54,20)-(54,
25)
530 LINE(55,20)-(70,20):LINE(52,15)-(69,
```

```
15):LINE(52,9)-(67,9):LINE(68,2)-(68,14)
:LINE(69,12)-(77,12):LINE(79,14)-(86,14)
:LINE(87,12)-(87,23):LINE(81,7)-(94,7):L
INE(71,18)-(77,18):LINE(71,19)-(71,39):L
INE(72,27)-(107,27):LINE(72,34)-(77,34)
540 LINE(70,40)-(80,40):LINE(80,39)-(90,
39):LINE(78,32)-(78,38):LINE(84,31)-(84,
38):LINE(86,38)-(97,38):LINE(79,30)-(100
,30):LINE(90,31)-(90,37):LINE(98,36)-(98
,46):LINE(86,24)-(90,24):LINE(91,23)-(99
,23):LINE(75,7)-(75,10):LINE(88,16)-(101
,16)
550 LINE(92,17)-(92,22):LINE(98,11)-(98,
15):LINE(101,20)-(113,20):LINE(108,25)-(
108,30):LINE(102,15)-(105,15):LINE(106,1
6)-(110,16):LINE(113,19)-(118,19):LINE(1
14,12)-(114,18):LINE(112,11)-(118,11):LI
NE(116,16)-(119,16):LINE(118,12)-(118,15
)
560 LINE(126,4)-(126,8):LINE(94,42)-(94,
45)
570 RETURN
1000 DATA11,2,12,2,13,2,12,23,13,24,13,2
5,14,26,14,27,15,28,16,29,17,30,17,31,18
,32,19,33,20,33,21,34,22,35,23,36,24,37,
21,24,22,25,23,25,24,26,25,27,26,27
1010 DATA27,28,28,28,29,29,30,30,28,2,28
,3,28,4,28,5,29,6,30,6,31,7,32,7,33,8,33
,9,34,10,34,11,35,12,36,12,47,38,48,38,4
9,39,50,40,51,40,52,41,53,41
1020 DATA54,40,55,41,56,41,57,42,58,42,5
9,43,60,44,61,45,62,46,63,47,64,47,64,46
,64,45,65,44,66,43,67,42,68,41,69,41,79,
38,80,38,81,38,79,31,80,29,81,28,97,29
1030 DATA98,28,97,26,98,25,99,24,99,22,1
00,21,81,26,82,25,83,25,84,25,80,25,79,2
4,79,23,78,22,77,21,77,20,78,17,77,13,76
,11,70,17,70,16,72,2,73,3,74,3,75,4
1040 DATA76,4,77,4,78,5,79,5,80,6,76,6,7
7,5,85,10,84,10,83,9,82,9,81,9,80,9,79,8
,78,7,77,7,76,7,95,8,96,8,97,9,97,10,101
,17,101,18,101,19,108,21
1050 DATA107,22,106,23,105,24,104,25,103
,25,102,25,102,26,101,31,102,31,103,32,1
04,32,105,32,106,31,107,31,102,33,101,33
,100,34,99,34,98,34,98,35,99,47,99,48,99
,49,98,50,94,47
1060 DATA94,46,93,41,92,40,91,40,98,33,9
7,32,96,31,96,30,109,24,110,23,111,22,11
2,21,119,18,119,17,120,15,121,14,122,13,
123,12,124,11,125,11,126,10,127,10,127,9
,125,4,124,3
1070 DATA97,49,96,49,95,48,120,17,123,4,
122,5,122,6,121,7,120,8,120,9,119,10,111
,12,110,12,109,12,108,13,107,14,106,14,1
11,17,112,18,85,25,77,19,78,16,78,15,78,
14,77,13
1080 DATA76,13,999
```

PCM

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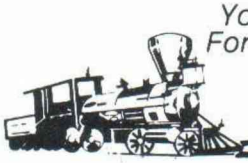

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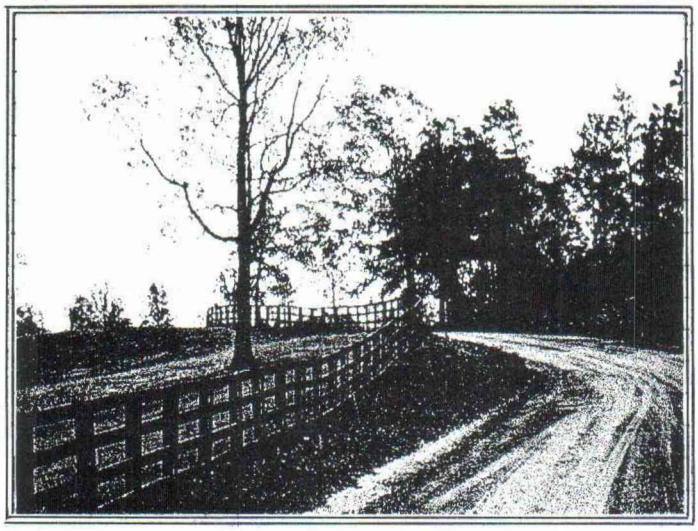
Take PoCo abroad this summer, along with these currency conversion tables for 28 foreign countries!

A Summer Exchange Program

By Robert Frowenfeld
PCM Contributing Editor



Ah summertime, when a young PoCoer's fancy turns to . . . traveling! And what better way to manage your travels in a foreign country than to have a handy dandy program that will do currency conversions for you instantly? This month's "On The Road" program, *CONV.BA*, will let you keep track of the exchange rates of 28 countries. With just a couple of keystrokes, you have the ability to convert U.S. dollars into a foreign currency (or vice versa). You can also display (and print out if you wish) a general conversion table of any country you choose. While the power of this program is substantial, it's really simple to use, so let's get to it.

First, a few basics. This month's program (as usual), uses a data file. The name of the data file used to store the countries' names, currency titles, and exchange rates is named *CONV.DO*. I created it with the Model 100's text editor which, incidentally, is how I write this column. If you happen to be traveling to one of the countries not listed (see the illustration) then just substitute the country's name, currency, and exchange rate and you'll be ready to go.

The first option on the PCM Currency Converter allows you to update the current exchange rate. You'll find this handy if you're in a country where the rates fluctuate considerably from day to day or if you are planning to make a big purchase where a small difference in the exchange rate can mean big bucks! As with every option selected from the main menu, you are asked to select a country by entering a number in the range of 1-28. Once you select the country, you will be asked to enter how many of that country's currency units you can get for a U.S. dollar. Don't get confused here. Many banks quote exchange rates in the number of U.S. cents or dollars for a country's currency unit. For example, if country ABC's unit of currency is XYZ, then you want to enter the number of XYZs you can get per dollar. If one XYZ is worth $0.25 in U.S. funds, you get 4.00 XYZs per dollar, and you want to enter 4.00 for the exchange rate.

Selections #2 and #3 from the main menu will permit you to do currency conversions. These functions both work the same way, but in opposite directions. Option #2 will convert a foreign currency into U.S. dollars. For example, you are strolling down the Champs Elyse in gay Paris and you notice that the price of a silk cravat is 100 French francs. Your trusty and loyal Model 100 will quickly tell you that this is $12.48 at the current exchange rate. Unfortunately, you have to come up with the 100 francs (you didn't expect this program to do everything, did you?).

Option #3 works just the opposite; that is, it converts an amount in U.S. dollars to that foreign currency. Let's say you're hungry while still in France, and you would like to get a meal that would cost you about $30. Your Model 100 will quickly tell you to look for a restaurant with the dinners priced at 240.45 francs. Magnifique, non?

The last function of the PCM Currency Converter permits you to print out a currency conversion table. Once you select a country, you are asked to choose between a table based in either U.S. dollars or the foreign currency. If you opt for the first choice, a table is displayed showing foreign currency equivalents for amounts between $1 and $1,000. If you choose for a table based on the foreign currency, a table will be displayed to cover a range of values that translates into the approximate range of 1 to 1,000 U.S. dollars. If you would like to change the range of factors for the tables, Line 55 contains the data for the selected 12 exchange values. Changing this line permits you to customize your conversion table to cover a range more to your liking.

Well, there you have it. Enjoy your vacation this summer. Bon voyage, and maybe we'll bump into each other sometime . . . en route (on the road)!

(Robert Frowenfeld owns his own computer programming firm in Louisville, Ky., and has completed his graduate course work in computer science at the University of Louisville.)

Data File
CONV.DO

```
"Argentina","Pesos", 33.14
"Australia","Dollars", 1.078
"Austria","Schillings", 18.36
"Belgium","Francs", 53.55
"Britain","Pounds", .6957
"Canada","Dollars", 1.277
"Colombia","Pesos", 94.47
"Denmark","Krone", 9.605
"Ecuador","Sucre", 59.34
```

```
"Finland","Markka", 5.588
"France","Francs", 8.015
"Greece","Drachmas", 103.75
"Hong Kong","Dollars", 7.801
"India","Rupees", 10.81
"Israel","Shekels", 156.05
"Italy","Lire", 1614
"Japan","Yen", 222.75
"Mexico","Pesos", 177.5
"Netherlands","Guilders", 2.94
"New Zealand","Dollars", 1.504
"Norway","Krone", 7.52
"Peru","Sols", 2707.11
"Portugal","Escudos", 133
"Spain","Pesetas", 148.8
"Sweden","Krona", 7.769
"Switzerland","Francs", 2.1645
"Venezuela","Bolivars", 7.5
"W. Germany","Marks", 2.608
```

Main Menu

```
PCM Currency Converter

1  Enter Conversion Factors
2  Compute in Dollars
3  Compute in Foreign Currency
4  Print Conversion Chart
5  End Program
   Select:
```

Country Selection

```
Select Country (1-28):
1 Argenti 8 Denmark 15Israel  22Peru
2 Austral 9 Ecuador 16Italy   23Portuga
3 Austria 10Finland 17Japan   24Spain
4 Belgium 11France  18Mexico  25Sweden
5 Britain 12Greece  19Netherl 26Switzer
6 Canada  13Hong Ko 20New Zea 27Venezue
7 Colombi 14India   21Norway  28W. Germ
```

Currency Conversion Examples

```
Compute Price in Dollars
France
Enter Price in Francs: 100

Actual Cost is: $12.48

Compute Price in Francs
France
Enter Price in U.S. Dollars: 30

Cost in Francs is: 240.45
```

Exchange Rate Tables

France

U.S.$	Francs	U.S.$	Francs	U.S.$	Francs
1	8	20	160	100	802
2	16	30	240	200	1,603
5	40	40	321	500	4,008
10	80	50	401	1,000	8,015

France

Francs	U.S.$	Francs	U.S.$	Francs	U.S.
1	0.12	20	2.50	100	12.48
2	0.25	30	3.74	200	24.95
5	0.62	40	4.99	500	62.38
10	1.25	50	6.24	1000	125

The listing:

```
1 CLEAR 1000:DEFINT I-N:DEFSTR A,R,U
2 BL$=STRING$(38," ")
5 ES$=CHR$(27):R=ES$+"p":U=ES$+"q":GOTO
35
6 LINEINPUT IN$:X=VAL(IN$):IF IN$<>"" TH
ENY=ASC(IN$):RETURN ELSE RETURN
35 DIM CY$(30),CU$(30),EX(30),FC(15),FD(
12)
40 NC=28
50 DATA "Enter Conversion Factors","Comp
ute in Dollars","Compute in Foreign Curr
ency","Print Conversion Chart","End Prog
ram"
52 FOR I=1 TO 5:READ M$(I):NEXT I
55 DATA 1,2,5,10,20,30,40,50,100,200,500
,1000:FOR I=1 TO 12:READ FC(I):NEXT I
60 KEY 1," "+CHR$(13)
75 I=1:OPEN "conv.do" FOR INPUT AS 1
80 IF EOF(1) THEN 90
85 INPUT #1,CY$(I),CU$(I),EX(I):IF I<28
THEN I=I+1:GOTO 80
90 CLOSE
100 CLS:CLOSE:PRINT@11,"PCM Currency Con
verter"
105 FOR I=1 TO 5:PRINT@(I+1)*40+7,R;I;U;
" ";M$(I);:NEXT I
120 PRINT@291,"Select: ";:A=INPUT$(1):X=
VAL(A):IF X<1 OR X>5 THEN 100 ELSE FX=X
130 PRINT USING"#";X;
140 ON FX GOTO 200,300,400,500,600
200 'enter conversion factors
210 GOSUB 700
220 IF IN$=" " THEN GOSUB 800:GOTO 100
225 CLS:PRINT @53,"Conversion Factor"
230 PRINT@124,"Country: ";CY$(CY);
235 PRINT@204,"Current Exch. Rate:";EX(C
Y);"/ $ U.S.";
240 PRINT @284,CU$(CY);" per U.S. Dollar
: ";:FL=8:GOSUB 6
245 IF IN$="" THEN 200 ELSE EX(CY)=X
250 GOTO 200
300 'comput in dollars
310 GOSUB 700
320 IF IN$=" " THEN 100
330 CLS:PRINT@48,"Compute Price in Dolla
rs":PRINT@80,TAB(19-LEN(CY$(CY))/2);R;"
";CY$(CY);" ";U;
340 PRINT@125,"Enter Price in ";CU$(CY);
": ";:GOSUB 6
345 IF X=0 THEN 100 ELSE PRINT@280,BL$;
350 PRINT@205,"Actual Cost is: $";
```

```
360 X1=X/EX(CY)
370 N=LOG(X1)/LOG(10)+1:PRINT USING STRI
NG$(N,"#")+".##";X1
380 GOSUB 900:GOTO 330
400 'display
410 GOSUB 700
420 IF IN$=" " THEN 100
430 CLS:PRINT@48,"Compute Price in ";CU$
(CY):PRINT@80,TAB(19-LEN(CY$(CY))/2);R;"
 ";CY$(CY);" ";U;
440 PRINT@125,"Enter Price in U.S. Dolla
rs: ";:GOSUB 6
445 IF X=0 THEN 100 ELSE PRINT@280,BL$;
450 PRINT@205,"Cost in ";CU$(CY);" is: "
;
460 X1=EX(CY)*X
470 N=LOG(X1)/LOG(10)+1:PRINT USING STRI
NG$(N,"#")+".##";X1
480 GOSUB 900:GOTO 430
500 'conversion table
510 GOSUB 700
520 IF IN$=" " THEN 100
530 CLS:PRIN TAB(19-LEN(CY$(CY))/2);R;"
 ";CY$(CY);" ";U;:PRINT@88,"(1) U.S. to
";CU$(CY);:PRINT@168,"(2) ";CU$(CY);" to
 U.S.":PRINT@252,"Enter: ";:A=INPUT$(1):
X=VAL(A):IF A=" " THEN RUN ELSE IF X<1 O
R X>2 THEN 530
540 PRINT@80,BL$;:PRINT@160,BL$;:PRINT@2
40,BL$;
550 IF X=2 THEN 570
555 PRINT@40,"";:FOR I=1 TO 3:PRINT"U.S.
$ ";LEFT$(CU$(CY),7);TAB(I*14);:NEXT I:P
RINT@80,"";:FOR I=1 TO 3:PRINT"----- ---
---- ";:NEXT I
560 FOR I=1 TO 3:FOR J=1 TO 4:K=(I-1)*4+
J:PRINT@(J+2)*40+(I-1)*14,USING"#,###";F
C(K);:IF FC(K)*EX(CY)>1E5 THEN PRINT " "
;USING"######";FC(K)*EX(CY); ELSE PRINT"
 ";USING"##,###";FC(K)*EX(CY);
562 NEXT J:NEXT I
565 GOSUB 900:GOTO 100
570 FOR I=1 TO 12:FD(I)=FC(I):NEXT I
571 IF EX(CY)>10 THEN FOR I=1 TO 12:FD(I
)=FD(I)*10:NEXT I
572 IF EX(CY)>100 THEN FOR I=1 TO 12:FD(
I)=FD(I)*10:NEXT I
575 PRINT@40,"";:FOR I=1 TO 3:PRINT LEFT
$(CU$(CY)+"      ",7)+" "+"U.S.$ ";:NEXT
I:PRINT@80,"";:FOR I=1 TO 3:PRINT"------
- ----- ";:NEXT I
580 FOR I=1 TO 3:FOR J=1 TO 4:K=(I-1)*4+
J:PRINT@(J+2)*40+(I-1)*14,USING"######";
FD(K);:IF I<3 THEN PRINT " ";
581 IF FD(K)/EX(CY)<100 THEN PRINT " ";U
SING"##.##";FD(K)/EX(CY); ELSE PRINT " "
;USING "#,###";FD(K)/EX(CY);
582 NEXT J:NEXT I
585 GOSUB 900:GOTO 100
599 GOTO 599
600 'end
610 CLS:MENU
700 'display routines
710 CLS:FOR I=1 TO 28:IR=((I-1) MOD 7)+1
:IC=INT((I-1)/7)*10:PRINT@40*IR+IC,R;MID
$(STR$(I)+" ",2,2);U;LEFT$(CY$(I),7);:NE
XT I
715 PRINT@0,BL$;
720 PRINT@7,"Select Country (1-28): ";:F
L=2:GOSUB 6:IF IN$=" " THEN RETURN ELSE
IF X<1 OR X>NC THEN 720 ELSE CY=X
725 RETURN
800 'save exch rates
810 OPEN "conv.do" FOR OUTPUT AS 1
820 FOR I=1 TO 30
830 PRINT #1,CHR$(34);CY$(I);CHR$(34);",
";CHR$(34);CU$(I);CHR$(34);",";EX(I)
840 NEXT I
850 RETURN
900 'pause
910 PRINT@289,"Press any key ... ";:A=IN
PUT$(1):RETURN
920 FOR I=1 TO 6:PRINT@40*I+8,R;I;U;" ";
CA$(I);TAB(22);USING"####.##";TT(I);:NEX
T I
930 GOSUB 700:IF A$=" " THEN RUN
940 RETURN
950 PRINT@289,"Press ";R;" F1 ";U;" to E
xit";:RETURN
```

PCM

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A Model 100 Calculator

By Nathaniel F. Ireland

Do you carry a calculator and your Model 100? You can leave your calculator at home now. With this program, your Model 100 becomes a convenient calculator which can do addition, subtraction, multiplication, division, roots and powers, and store a constant or other figure in memory for retrieval as required. The program uses less than 1350 bytes of memory and will run nicely in an 8K machine.

LIMITATIONS:

The largest whole number which the program will accommodate is 99,999,999 and the smallest decimal is .00001. These limits are set by display size constraints.

Roots are entered as their decimal equivalents. For example, a square root is decimal point 5; this will cause a resultant inaccuracy when using a repeating decimal such as for cube root, decimal point 33333.

Only a total can be placed in memory and only the last one placed in memory will be retained.

MATHEMATICAL OPERATORS:

'A' serves as the addition enter key and also re-enters a total in the next column.

'S' serves as the subtraction enter key.

'X' serves as the multiplication enter key.

'/' serves as the division enter key.

'P' serves as a root or power enter key.

FUNCTIONAL OPERATORS:

'D' serves to delete a figure before it is entered and also to clear the memory.

'T' serves as the total enter key.

MEMORY OPERATORS:

UP ARROW places a total into memory.

DOWN ARROW retrieves a figure from memory.

PRESETS:

The NUM key may be depressed to enable the keypad.

SHIFT and ENTER keys are not used.

CAPS LOCK keys may be up or down.

USING THE PROGRAM:

When the program is loaded and run, the title page will appear. Answer the decimal place question by entering the number of decimal places you plan to use. The screen will clear and the Calculator Program is ready to operate.

ENTERING FIGURES:

Type a number and notice as you type that each digit is displayed on the left side of the screen as it is typed. If you make a typing error, press the 'D' key and the incorrect number will disappear. The number then can be retyped.

When the typed number is correct, press the 'A' mathematical operator key. The number will disappear at the left side of the screen and appear on the right. The number is entered now and cannot be deleted. Notice that a plus sign is located to the right of the number. This only indicates that the number is positive. A negative number can be entered by pressing the 'S' key instead of the 'A' key and it will be so indicated by a minus sign on the right. Now type your second number and it will appear one line lower on the left side of the screen. Delete this figure by pressing the 'D' key and retype if necessary. When correct, enter the figure by pressing the desired mathematical operator key. The column can be totaled now or more figures can be entered in the above manner before totaling.

TOTALING:

To total a column press the 'T' key. A line will be drawn on the screen and the column result displayed below the line.

OPTIONS AFTER TOTALING:

The figure resulting from totaling can be placed in memory (see heading: Placing A Figure In Memory).

Or this figure can be also inserted as the first figure in the next line by pressing the 'A' key.

(Nathaniel Ireland is a retired electronics engineer and lives on his mini-farm in southern New Hampshire. Besides enjoying the out-of-doors, he finds time to travel, do occasional consulting and work with his TRS-80 computers.)

Or a figure previously stored in memory can be inserted as the first figure in the next column (see heading: Retrieving A Figure From Memory).

Or a new figure can be entered (see heading: Entering Figures).

Note: Re-entry of a total must be accomplished as the first item of the next column. A figure returned from memory can be inserted as any item in a column.

PLACING A FIGURE IN MEMORY:

Only a total result can be placed in memory. To enter a result in memory, press the up-arrow key. The upper left of the screen will display 'MEM' and the result figure.

To enter a constant in memory, enter the figure in the normal manner and press the 'T' key. Enter the total result as above.

RETRIEVING A FIGURE FROM MEMORY:

To retrieve a figure from memory, press the down-arrow. The figure will appear on the left side of the screen as if it were typed. Press the desired mathematical operator key to enter the figure.

CLEARING THE MEMORY:

Press the down-arrow and then the 'D' key.

PROGRAM TERMINATION:

Press the SHIFT and BREAK keys.

PCM BAR CODED LISTING

```
10 CLS
20 REM**     CALCULATOR     **
30 REM** BY N. F. IRELAND **
40 REM**     JULY, 1983     **
50 PRINT@51,"CALCULATOR PROGRAM"
60 PRINT@124,"Read the article for instr
uctions."
70 PRINT@200,;:INPUT"ENTER NUMBER DECIMA
L PLACES ( 0-5)";D%:IFD%<0ORD%>5THEN70
80 CLS:G$="###,###,###."+STRING$(D%,"#")
90 A$=INKEY$:IFA$=""THEN90
100 IFASC(A$)=30ANDRE=1THENM=Y:A$="":M1=
1:PRINT@0,"MEM";:PRINTTAB(2)USINGG$;M:PR
INT@X,;:GOTO90
110 IFASC(A$)=31ANDM1=1ANDB$=""THENA$=""
:B$=STR$(M):MC=1:IFRE=1ANDX<280THENX=X+4
0:RE=0:Y=0:GOTO250:ELSEIFRE=1THENPRINT:Y
=0:RE=0:GOTO250:ELSE250
120 IFA$="D"ANDMC=1ORA$="d"ANDMC=1THENB$
="":A$="":PRINT@X,SPACE$(39);:M=0:M1=0:P
RINT@0,SPACE$(20):PRINT@X,;:GOTO90:ELSEI
FA$="D"ORA$="d"THENB$="":A$="":PRINT@X,S
PACE$(39);:GOTO90
130 IFA$="A"ANDB$=""ANDRE=1ORA$="a"ANDB$
=""ANDRE=1THENRE=0:A$="+":B$=STR$(Y):Y=0
:IFX<280THENX=X+40:GOTO260:ELSEPRINT:GOT
O260
140 IFRE=1THENRE=0:Y=0:IFX<280THENX=X+40
:ELSEPRINT
150 IFM1=1ANDB$=""THENPRINT@0,"MEM";:PRI
NTTAB(2)USINGG$;M:PRINT@X,;
160 IFA$="."THEN240
170 IFB$=""ANDA$="T"ORB$=""ANDA$="t"THEN
A$="":GOTO330
180 IFA$="X"ORA$="x"THENA$="X":GOTO260
190 IFA$="A"ORA$="a"THENA$="+":GOTO260
200 IFA$="/"ANDB$="0"THENA$="D":GOTO120:
ELSEIFA$="/"THEN260
210 IFA$="P"ORA$="p"THENA$=CHR$(152):GOT
O260
220 IFA$="S"ORA$="s"THENA$="-":GOTO260
230 IFA$="0"ORVAL(A$)*1=>1THEN240:ELSEA$
="":GOTO90
240 B$=B$+A$:A$=""
250 PRINT@X,;:PRINTTAB(5)B$;:GOTO90
260 PRINT@X,;:PRINTTAB(20)USINGG$;VAL(B$
);:PRINTA$;
270 IFA$="+"THENY=Y+VAL(B$)
280 IFA$="X"THENY=Y*VAL(B$)
290 IFA$="/"THENY=Y/VAL(B$)
300 IFA$="-"THENY=Y-VAL(B$)
310 IFASC(A$)=152ANDY<0THENA$="D":GOTO12
0:ELSEIFASC(A$)=152THENY=Y^VAL(B$)
320 MC=0:B$="":A$="":GOTO350
330 PRINT@X,;:PRINTTAB(20)STRING$(18,"-"
);:IFX<280THENX=X+40:ELSEPRINT
340 PRINT@X,;:PRINTTAB(20)USINGG$;Y;:RE=
1
350 IFX<280THENX=X+40:ELSEPRINT
360 IFM1=1THENPRINT@0,"MEM";:PRINTTAB(2)
USINGG$;M:PRINT@X,;:GOTO90:ELSE90
```

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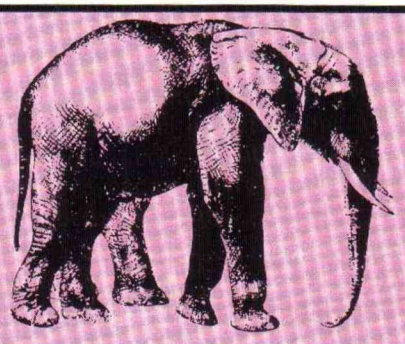

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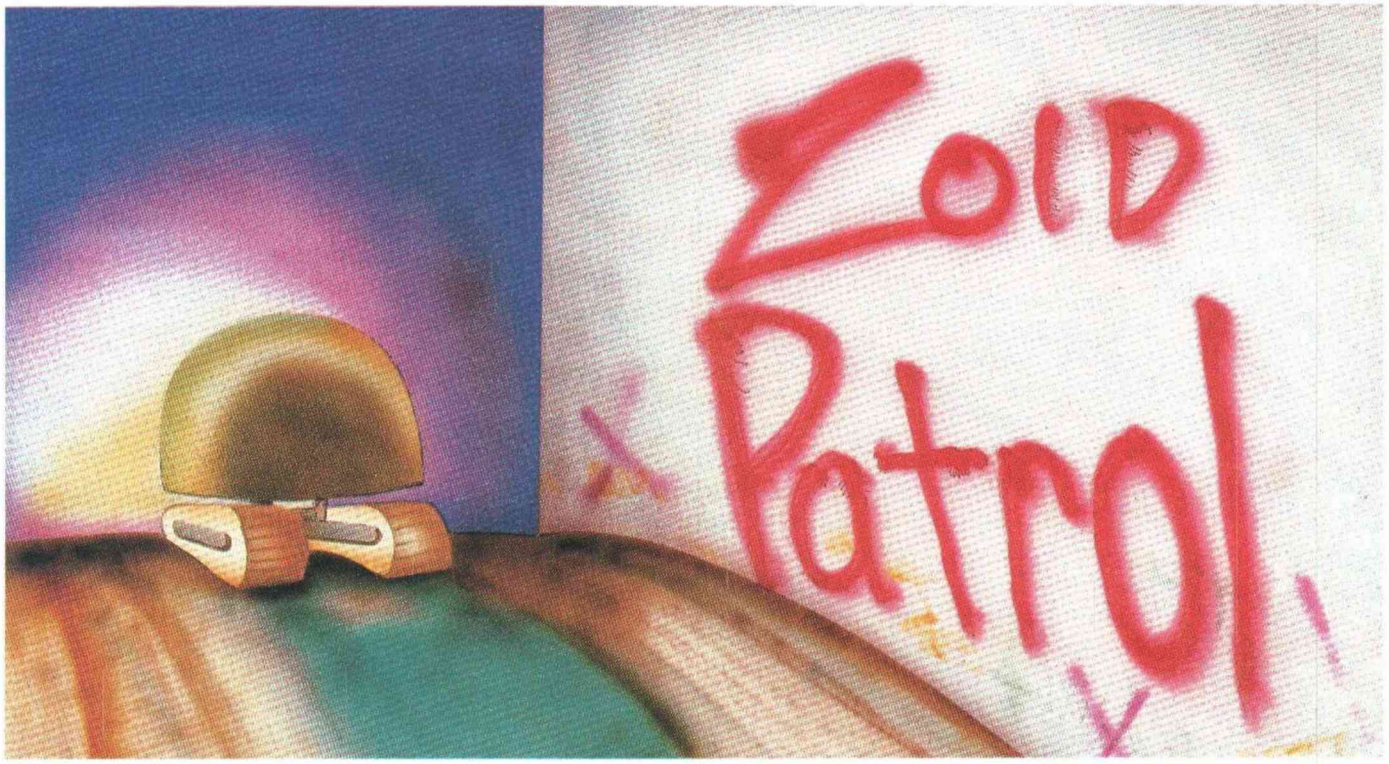
Here's a game which is not only fun to play, but can show you how to write your own arcade-style diversions for the Model 100 — that is, if the Zoids don't get you first!



By Ben Firschein

You can turn your Model 100 into the arcade game of your dreams. This article describes *Zoid Patrol*, a video game that features graphics, inverse video and music, and makes use of some interesting memory locations. I will discuss how to use these features in your own video games. *Zoid Patrol* runs in 8K. You can remove the REMs following the colon in the program lines to conserve memory.

The Program

In *Zoid Patrol*, you must use the arrow keys to navigate a maze that is patrolled by the dreaded Zoids. The Zoids try to track you down and catch you. If one gets you, it will decimate you; the program will then play a funeral dirge. You can choose the number of Zoids that patrol the maze from one to six where one equals easy and six equals pro.

You gain points by staying alive and hitting targets. Number targets are worth 1,000 times the number on the target, and targets with a 'C' on them are worth 500,000 points. Scoring is accompanied by sound effects. You lose 300 points if you hit a non-target barrier, and 10 points if you touch a key other than an arrow key. The program also features "wrap around" — if you go off the screen, you will end up on the other side if there is not a barrier in the way.

The program maintains a RAM file to keep track of the high score. When you run the program it displays the high score and scorer if it has been played at least once since it was loaded. If you beat the high score, the program will inform you (while playing the Marine Hymn) that you have broken the record. It will then ask you for your name. Your name and your score will be stored in the RAM file.

How It Works

The Constants Section (Lines 16-88): This section shows the memory locations and graphics characters the program uses. Location 65446 stores the code (not in ASCII) of the last key pressed. I use this location instead of INKEY$, because INKEY$ has an annoying auto-repeat feature; if you hold down a key for more than a few seconds, the Model 100 will think you pressed it several times. Location 65024 is the start of the screen memory. I PEEK at the screen memory to see if the player has hit a barrier or a target, and if a Zoid has hit a barrier or the player. Since there are 40 characters per line, if "loc" is the location of the player, the positions left, right, above and below the player are respectively: loc-1, loc+1, loc-40, loc+40. Location 63791 is a timer (with values 0-125). I use the timer to randomize the random number generator (see Lines 2000-2060). Line 75 shows how to use inverse video: printing "ESC p" turns on inverse video and printing "ESC q" turns it off. Lines 80-87 are the ASCII codes for the barrier, targets, Zoids and player. Note that inverse video numbers have the same ASCII codes as standard video numbers.

Initialization (Lines 89-120): The program calls subroutines that load music data, print instructions, randomize the

number generator, set up the barriers, and set up the Zoids. It then plays a tune (Line 108), and waits for the user to hit a key. Tunes are stored in a two-dimensional array, T%. The designation T% (4,z) refers to the zth note of the 4th tune.

Main Program (Lines 150-560): Here is where the program displays the player, and shows the score at the bottom of the screen. The PRINT USING command (Line 165) causes the score to be displayed in a field width of six. Line 200 determines the most recent key pressed (not in ASCII). To find the codes for the keys you want to use in your own video game, write the one-line program: 10 PRINT PEEK(65446):GOTO 10 and then hit the keys with the one line program running. The codes for the left, right, up and down arrow keys are respectively, 44, 45, 46, 47. Lines 505-530 test for targets and barriers. Lines 540-550 cause the player to wrap around if he or she goes off the screen.

Set Up Barriers (Lines 1000-1042): There are up to 75 barriers or targets on the screen. The chance of getting a bonus barrier (500,000 points) depends on the number of Zoids chosen (2*number/50). If a player selects one Zoid there is a four percent chance of a bonus barrier; if an intrepid (and suicidal) player selects six Zoids there is a 24 percent chance of a bonus barrier.

Randomize (Lines 2000-2060): RND always generates the same random number series. If you use memory location 63791, you can access a timer with 126 possible values, and thus start the generator at one of 126 possible locations. This subroutine uses a FOR loop with an RND statement in it to move the number generator forward.

Set Up Enemy (Lines 3000-3090): These lines use the random number generator to pick a position on the screen to place a Zoid.

Move Enemy (Lines 4000-4070): The strategy the Zoids use to catch the player is quite simple and can be used in other video games that require pursuit. The strategy is two-fold:

1) Convert the location of the player to X,Y coordinates. For each Zoid, convert its location to X,Y coordinates. Take the sign (+ or –) of the difference of the X coordinates to find out which direction to move to decrease the horizontal distance between the Zoid and the player. Do the same with the Y coordinates to determine which direction to move to decrease the vertical distance.

2) If the Zoid will not go off the screen and there is not a barrier in the way, move the Zoid. Otherwise, move the Zoid in a random direction.

This simple strategy makes the Zoids very efficient at tracking down the player and at extricating themselves from dead ends in the maze. One advantage the player has, however, is that he or she can use "wrap around" to move to the opposite side when in imminent danger of destruction. Instead of wrapping around, the Zoids will start moving over to the other side.

Dead (Lines 5000-5190): All players will eventually succumb to the impulse to risk themselves in the quest for a 500,000 target dangerously close to some Zoids. This section of the program provides the appropriate sound effects and graphics for their demise. After the word "MUNCH" appears on the screen, the Zoid will blink on and off to the accompaniment of random tones (Lines 5020-5035). The words "YOU ARE DEAD" then blink on and off in inverse video, synchronized with a bit of "funeral" music (Lines 5050-5070). Line 5060 plays the odd notes, and Line 5067 plays the even notes. If you have broken the high score, then it is recorded in Lines 5107-5147.

Load Music Data (Lines 6000-6240): The notes for the music are stored here. You can incorporate this subroutine into your own video game to add sound effects to it.

Instructions And Specs (Lines 7000-7300): Line 7012 opens the RAM file that stores the high score and scorer. If the file is not present, the "error interrupt" declared in Line 10 of the program causes the program to continue running. If there is a high scorer, the score and the scorer are displayed. The program then displays instructions and asks for the number of Zoids.

With the techniques used in *Zoid Patrol* you should be able to write your own video game. Space Wars! Computerized Ping Pong! Maybe even the definitive *Porta-Kong*! The possibilities are endless.

The listing:

```
1 'ZOID PATROL
2 'BEN FIRSCHEIN
3 'DECEMBER 1983
4 '
10 ON ERROR GOTO 7030
12 '
16 REM -----CONSTANTS---
17 REM
20 DIM T%(4,15):REM stores tunes
30 D(1)=-1:D(2)=1:D(3)=-40:D(4)=40:REM d
irections ← → ↑ ↓
40 MS=279:REM maximum allowed screen pos
ition
50 BOARD=65446:REM memory loc stores cod
e (not in ascii) of last key pressed
60 SCRN=65024:REM start of screen memory
70 TIMER=63791:REM memory location of ti
mer. values 0-125
75 ESC=27:REM ascii code for ESC. Printi
ng ESC p turns on reverse video.
77 REM printing ESC q turns off reverse
video
80 BARRIER=239:REM ascii code for grph x
82 EXTRA=171:REM extra points
84 EMPTY=32:REM ascii code of space
85 ENEMY=144:REM ascii code for grph y
87 PLAYER=147:REM graph q
88 '
89 REM ----initialization---
90 '
91 GOSUB 6000:REM load music data
92 GOSUB 7000:REM print instructions and
 ask user for set up
102 GOSUB 2000:REM randomize
103 GOSUB 1000:REM set up barriers
104 GOSUB 3000:REM set up enemies
105 L=160:PRINT@L,CHR$(PLAYER);
106 PS=100:REM player's score
107 PRINT@MS+1,"HIT ANY ARROW KEY TO STA
RT";
```

```
108 FOR Z=1 TO 11:SOUND T%(4,Z),10:NEXT
Z:REM play tune #4
109 K$=INKEY$:IF LEN(K$)=0 THEN 109:REM
wait for a key to be pressed
110 PRINT@ MS+1,SPACE$(30);
120 '
150 '----Main Program----
152 '
160 PRINT@L,CHR$(PLAYER);
165 PRINT@MS," SCORE: ";:PRINT USING"###
#####";PS;
170 GOSUB 4000:REM move enemy
200 P=PEEK(BOARD):REM most recent key pr
essed
205 PRINT@ L," ";
206 IF P<44 OR P> 47 THEN PS=PS-10:GOTO
160:REM not an arrow key
208  PS=PS+100: REM player gets 100 pts
for staying alive
210 D=D(P-43):REM direction to move. 44
is code (not ascii) for left arrow
505 PK=PEEK(SCRN+L+D):REM see what is on
 screen where player wants to move
507 IF PK<>EXTRA THEN 510:REM hit a bonu
s target?
508 PRINT@MS+1,"BONUS";:PRINT@L+D,CHR$(B
ARRIER):D=0:PS=PS+50000
509 FOR Z=1 TO 9:SOUND T%(3,Z),3:NEXT Z:
REM play tune #3
510 IF PK<49 OR PK>57 THEN 523:REM 49 is
 ascii code of '1'
511 REM player hit a number barrier
512 FOR ZZ=1 TO 4:SOUND T%(4,ZZ),5:NEXT
ZZ:REM tune#4
515 PRINT@L+D,CHR$(BARRIER);:D=0:PS=PS+1
000*(PK-47):REM hit numb
523 IF PEEK(SCRN+L+D)<>EMPTY THEN SOUND
500+(P-43)*500,4:D=0:PS=PS-300:'barrier
530 L=L+D:REM move
540 IF L>MS THEN L=L-MS:REM offscreen
550 IF L<1 THEN L=MS+L:REM offscreen
560 GOTO 160
570 '
1000 REM ----set up barriers
1002 '
1010 FOR K=1 TO 75:L=INT(RND(1)*MS+1):RE
M random location of barrier
1015 T=INT(RND(1)*5):REM type of barrier
1020 IF T<>0 THEN PRINT@L,CHR$(BARRIER);
1025 IF T=0 THEN PRINT@L,CHR$(ESC);"p";C
HR$(INT(RND(1)*9+49));CHR$(ESC);"q";
1026 '      a number target
1027 T=INT(RND(1)*50):IF T<NUMBER*2 THEN
 PRINT@L,CHR$(EXTRA);:REM bonus target
1030 NEXT K
1040 RETURN
1042 '
2000 REM ----randomize---
2002 '
2010 R=PEEK(TIMER)+1:REM ACCESS TIMER FO
R VALUE BETWEEN 1 AND 126
2020 FOR I=1 TO R
2030 DUMMY=RND(1)
2040 NEXT I
2060 RETURN
2062 '
3000 REM --set up enemy---
3002 '
3020 FOR E=1 TO NUMBER
3040 L=INT(RND(1)*MS+1):REM random locat
ion
3050 PRINT@ L,CHR$(ENEMY);
3060 L(E)=L:REM store
3070 NEXT E
3090 RETURN
3095 '
4000 REM ----move enemy---
4002 '
4010 Y=INT(L/40):X=L-Y*40:REM convert to
 x y coordinates
4020 FOR E=1 TO NUMBER
4030 Y2=INT(L(E)/40):X2=L(E)-Y2*40:REM c
onvert to x,y
4040 X2=X2+SGN(X-X2):Y2=Y2+SGN(Y-Y2)
4042 NL=Y2*40+X2:REM new location
4047 IF PEEK(SCRN+NL)=PLAYER THEN 5000:R
EM player has been caught
4048 IF PEEK(SCRN+NL)<>EMPTY THEN NL=L(E
)+D(INT(RND(1)*4+1)):'move randomly
```

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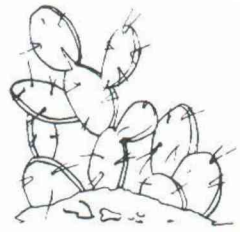

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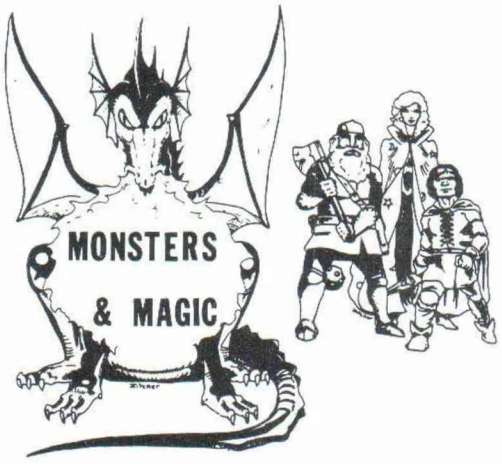

Monsters & Magic

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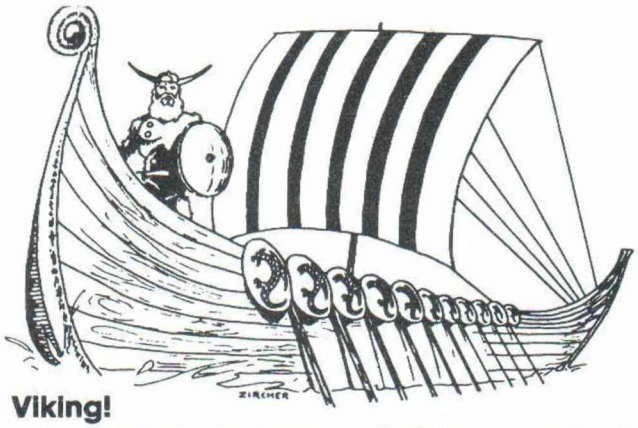

Viking!

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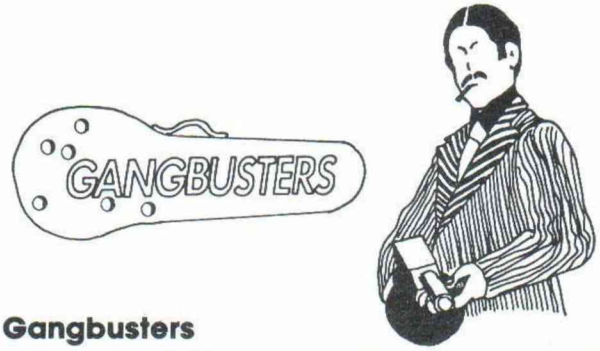

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```
4049 IF NL>MS OR NL<1 THEN 4060:REM dont
 go off screen
4055 IF PEEK(SCRN+NL)=EMPTY THEN PRINT@
L(E)," ";:L(E)=NL:PRINT@ NL,CHR$(ENEMY);
4057 '     move enemy if it will not hit
 a barrier
4060 NEXT E
4070 RETURN
4072 '
5000 REM -----dead---
5002 '
5005 PRINT@L(E)," ";
5010 PRINT@NL,CHR$(ENEMY);
5015 PRINT@MS+20,"MUNCH";
5020 FOR I=1 TO 10
5025 PRINT@NL," ";
5030 SOUND INT(RND(1)*1000+500),3
5032 PRINT@NL,CHR$(ENEMY);
5033 SOUND INT(RND(1)*1000+500),3
5035 NEXT I
5036 FOR ZZ=1 TO 200:NEXT ZZ
5037 FOR K=1 TO 6
5050 PRINT@MS+20,"YOU ARE DEAD";
5060 SOUND T%(1,K*2-1),10:REM play a not
e of tune #2
5065 PRINT@MS+20,CHR$(ESC);"pYOU ARE DEA
D";CHR$(ESC);"q";
5067 SOUND T%(1,K*2),10:REM play a note
of tune #2
5070 NEXT K
5100 IF PS<=HS THEN 5172
5102 '
5105 FOR Z=1 TO 11:SOUND T%(4,Z),10:NEXT
 Z
5107 CLS:PRINT:PRINT"CONTRATULATIONS!!!"
5110 PRINT "YOU HAVE BROKEN THE HIGH SCO
RE!"
5120 FOR Z=1 TO 11:SOUND T%(3,Z),10:NEXT
 Z
5125 PRINT
5130 INPUT"please enter your name ";NM$
5140 OPEN "SCORES.do" FOR OUTPUT AS 1:RE
M stores high score & scorer
5142 PRINT#1,PS:REM store player's score
5144 PRINT#1,NM$:REM store player's name
5146 CLOSE 1:CLS
5147 PRINT@161,"THE HISTORIC DEED HAS BE
EN RECORDED"
5150 '
5172 PRINT@1,"   GAME OVER   ";
5174 PRINT@MS+1,"HIT SPACE BAR TO PLAY,
ENTER TO STOP";
5178 K$=INKEY$:IF LEN(K$)=0 THEN 5178
5180 IF K$=" " THEN 92:REM play
5185 IF ASC(K$)=13 THEN CLS:END:REM 13 i
s ascii for ENTER key
5190 GOTO 5178
5192 '
6000 REM ---load music data---
6002 '
6010 DATA 4697,4697,4697,4697,3950,,4184
,4184,4697,4697,4976,4697,4697
6012 '     funeral march
6020 DATA 6269,6269,6269,7900
6022 '     beetoven's fifth
6030 DATA 3134,4976,4184,4184,4184,4184,
4184,3134,4184
6032 '     halls of montezuma
6040 DATA 1567,2348,2092,1864,2092,2348,
2092,1864,2348,2348,2348
6042 '     video game tune
6100 RESTORE
6200 FOR K=1 TO 12:READ T%(1,K):NEXT K
6210 FOR K=1 TO 4:READ T%(2,K):NEXT K
6215 FOR K=1 TO 9:READ T%(3,K):NEXT K
6230 FOR K=1 TO 11:READ T%(4,K):NEXT K
6240 RETURN
6242 '
7000 REM ---instructions and specs--
7002 '
7012 OPEN "scores.do" FOR INPUT AS 1:REM
 stores high score and scorer
7016 INPUT #1,HS:INPUT #1,SC$:REM READ T
HE HIGH SCORE AND THE SCORER
7018 CLOSE 1
7020 GOTO 7090
7030 IF ERR<>52 THEN PRINT "error ";ERR;
" in line ";ERL:END:ELSE RESUME 7090
7032 '     52 is error code for file not
found
7090 CLS
7092 PRINT CHR$(ESC);"pZOID PATROL";CHR$
(ESC);"q";
7094 IF HS<>0 THEN PRINT " HIGH SCORE:";
:PRINT USING"########";HS;:PRINT" ";
7095 IF HS=0 THEN PRINT
7096 PRINT USING"\      \";SC$;:REM six
spaces between slashes
7100 PRINT
7105 PRINT"USE ARROW KEYS (";CHR$(152);C
HR$(153);CHR$(154);CHR$(155);")";
7107 PRINT" TO MOVE. TO SCORE,";
7108 PRINT "HIT: ";CHR$(ESC);"p1";CHR$(E
SC);"q = 1000 pts ";CHR$(ESC);"p9";
7110 PRINT CHR$(ESC);"q = 9000 ";CHR$(EX
TRA);"= 50000
7115 PRINT "IF HIT: ";CHR$(BARRIER);" LO
SE 300 PTS. ";
7120 PRINT "THE ZOIDS ( ";CHR$(ENEMY);"
)"
7125 PRINT "WILL KILL YOU ( ";CHR$(PLAYE
R);" ) IF THEY CATCH YOU!";
7196 PRINT@280,"number of ZOIDS (1-6) 1=
easy 6=pro ? ";
7197 N$=INKEY$:IF LEN(N$)=0 THEN 7197:EL
SE NUMBER=VAL(N$)
7198 IF NUMBER<1 OR NUMBER >6 THEN 7197
ELSE PRINT NUMBER;
7250 CLS
7300 RETURN
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PCM

SOFTWARE

Traveling Software's *T-Base* Is A Superb Data Manager

After spending a good deal of time running and experimenting with *T-Base*, the new relational database manager from Traveling Software of Seattle, Wash., I am pleased to announce that this is one of a number of truly good software packages available for the Model 100. Best of all, it is available at a very reasonable price.

The *T-Base* package form Traveling Software is actually a three-part set. you get *T-Base*, *T-Base Report Generator* and *Memory Manager*. *T-Base*, as its name implies, is a database management program that permits you to construct files of related information, sort them, select specific records and — in fact — do just about anything necessary to manage data.

The *T-Base Report Generator* prints reports from your previously-created *T-Base* databases. And last, but not least, the *Memory Manager* helps you organize your computer's memory by keeping track of the amount of memory your data and text files use!

There are a number of database managers on the market. Where *T-Base* stands head and shoulders above the others I have seen so far is in its ability to retrieve information from one file and use it in your database. This would include spreadsheets. The implications of this in a program which uses as little memory as does *T-Base* are, to use a popular phrase which is applicable here, awesome!

Weighing in at just under 7K bytes, *T-Base* is a well-written, smooth-running program that lets you create data files of related information with ease. To get started, you first use the Model 100's *TEXT* program to describe what you want your database and input screen to look like. This can be a bit of a problem if you don't pay close attention to the documentation. I feel that a separate program designed to prompt the user for this information would be extremely helpful.

Fortunately, the cassette comes with several examples of pre-defined screens and databases, so the user can learn by looking at the examples. For each datum filed, you can specify if it is to be text, numeric, dollar, or a date type entry. Date entries are even automatically checked to insure valid input. You can also specify a set of input values that are permitted so that you can force the user, for example, to enter 'Y' or 'N' for a yes/no type of response. Another nice feature of *T-Base* is the fact that it allows you to create input screens that are larger than your Model 100's eight-line screen. If you need more lines, the program nicely scrolls so you can continue your input. If you make a mistake, you can use the Model 100's arrow keys to get back to the particular field you want to correct, even if the field has already scrolled off the screen. This input format was well thought out, and, as a programmer myself, I tip my hat to a difficult task well done.

As we mentioned earlier, one of the most useful features of *T-Base* is the fact that you can "borrow" information from databases other than the one you are working with. For example, if you are typing a sales order into the SALES database and you are prompted for the customer ID, you have only to type in the customer's ID code and *T-Base* automatically displays the customer's name and address that it retrieves from the CUSTOMER database. Then, let's say, you enter a product code. *T-Base*, retrieves the product name from the PRODUCT database and displays it along with the vendor's name that it pulls from the VENDOR database. This is super!

In this fashion, one can create a "system" of databases, each one tied together by linking field names between each related database. This is all done when you create the initial screen format for each database and, because the screen formats are stored in a text file, you can always quickly get into it via *TEXT* and make any corrections and/or modifications. You can also retrieve data from spreadsheets — a very significant ability.

The *T-Base Report Generator* permits you to create professional-looking reports from your databases. Like *T-Base* itself, the report generator lets you specify a primary database to be printed, yet it can also borrow information from other databases to be printed. Some of the more interesting features include the ability to sort your primary database for input as well as to specify subtotals and grand totals for any field(s) you desire.

When sorting, you have the option to leave the database in its sorted structure, or to have it remain in its unsorted (originally entered) form. This can be very useful. Using my previous example for sales orders, you might want to sort your sales orders by customer in order to print bills, then sort by vendor to print purchase orders, then sort by product type for inventory purposes.

All in all, *T-Base* packs a tremendous amount of power in a small package. If you have a 32K machine, you can easily keep *T-Base*, *T-Base Report Generator* and *Memory Manager* in your machine concurrently and still have room to store a lot of information. At the introductory price of $79.95, its a super buy for anyone in need of a database management system.

Memory Manager should really turn you on. That is because it, at least for me, solves many of the problems affecting the Portable Computer — not knowing how much memory a specific file occupies.

I know I'm not alone when I say that I'm always worrying about my usage of the Model 100's memory. Have you ever wondered how much memory a particular program or text file occupies on your machine? Well, whether you have 8K or 32K, it just seems as if you never have enough memory, and you're always trying to figure out which file(s) to delete to make room for others. *MEMMGR* (the *Memory Manager*) is a little program (only 1769 bytes) that is really worth its weight in gold! It comes free with *T-Base*, but its definitely worth a lot more. When you run *MEMMGR*, the program displays each file you have stored in your Model 100. For each file you are given its status (visible or invisible) and the number of bytes it takes up in your machine. You then have the option to either kill, rename, make visible or invisible any file. Making a file invisible is a nice and easy way to keep your programs, text files, etc., from being looked at by unauthorized users. Also the ability to kill and rename files without going into BASIC and having to remember the exact syntax of each command is nice. I think this is the type of program you would always want to keep in your Model 100 — its nifty!

(Traveling Software, 11050 Fifth Avenue N.E., Seattle, WA 98125, $79.95 through June 30; $99.95 thereafter)

— Robert Frowenfeld

SOFTWARE

Sky Raider
LCD 'Arcade' Fun

If you're going to pack the kids in the car for a summer vacation trip, pack along the old Model 100 loaded with games and the kids won't ever get bored. *Sky Raider* is a game based on a familiar premise: the aliens are going to land on Earth and you've got to shoot them out of the sky to save the planet. Although this is an all-BASIC program, some ingenious software design allows this game to run faster than any I've tried, and the sound effects are dazzling. I've often wondered what Radio Shack had in mind when they included some of those graphics characters. You've got foreign language symbols, up and down arrows, a phone, human stick figures, car, airplane and what looks like a house with the letter 'p' in inverse video. Those characters do offer games programmers quite a bit of flexibility, and the people at Alpine Data Systems in Elizabeth City, N.C., have made use of the Model 100's unusual symbology to come up with a tailor made invaders-type game.

Playing the game

Loading *Sky Raider* will take up 7.5K of RAM, and as soon as you run the game it creates a small second file named *SCORE2.DO* to keep track of

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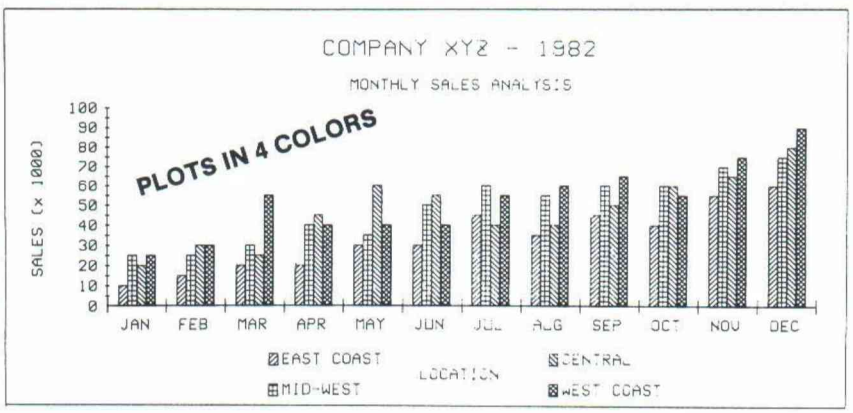

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the highest scores. More on that "hall of fame" arcade-type feature in a moment. The scenario is typical — as the sole defender of the planet "Andromada" (their spelling) you have four weapons-equipped spaceships to shoot down the invading "Borons." The Borons descend from the upper part of the screen, while your ship is on the "planet surface" at the bottom of the screen. You rack up points shooting down each Boron (100 points for a direct hit, 50 if you wing them). As the score gets over 3,000 (and you can earn bonus fuel), they begin to descend faster and faster. Also, the action will freeze on occasion as the "Mother Ship" (asterisk and four brackets) comes into view . . . but you have only one shot to try and hit it — a direct hit is the big payoff: 500 points. And you can get 200 or 300 points for either cracking the shields or hitting the ship. The speed of the action is pushing the LCD screen to the maximum, and I'd guess that speed is aided by using characters already existing in ROM. Three numeric displays on top read out high score, current score, and which round you are playing. You also see how many ships you have remaining in the upper left corner.

You play the game by using the left- and right-arrow keys to maneuver your ship — it's that "police house" character you get when you push Graph, M. You fire your gun (straight up only) by pressing the Space Bar. The "Boron" is actually three characters wide using the "o" with two dots on top (Code o) flanked by two "carrots" (Shift, 6). This alien spaceship is always on the move from side to side, and occasionally dips down one line lower. If he gets all the way to the "planet surface" at the bottom of the display, your spaceship is wiped out and you lose points. You also spend 10 points every time you fire your spaceship gun (firing "up arrows," or Graph, o's) — and that teaches ammo conservation. One thing to keep in mind: the Model 100 never forgets a command, so pressing the arrow key too fast will make it uncontrollable . . . your ship just keeps moving until it catches up with the backlog of commands. The game has enough bells and whistles to keep one occupied for many enjoyable sessions. If the phone rings or you want to "Pause" for any reason, just hit the 'p' and the bottom line goes into inverse video and displays the time of day! Then, press any key to resume the action. Or, since you're using up fuel as you go through each of the four spaceships, you can press the 'F' key to get a readout on how much fuel is left. The game then resumes automatically about two seconds later. If you just get frustrated with those pesky Borons, or it's time to eat, you can press 'Q' and quit at anytime. (The BREAK key is disabled on this version.)

And a final nice touch: that second file that was created upon running the program, *SCORE2.DO*, is where your initials and high score are placed each time you've outdone yourself (or work up to the maximum eight entries). The great thing about the Model 100 is that the *SCORE* file remains in memory, so you have a permanent running record of who made what top score. That has to be a unique feature, thanks to the 100's energy-sparing CMOS memory chips. When you option to return to the menu, you first see your initials and high scores come up in a flashing "Hall of Fame" display. The game switches to the menu after a third graphics display finishes, saying "Thank you for playing *Sky Raider*," animated by a pair of stick figures seemingly jumping up and down.

The Bottom Line: It's fun

You catch on fast, and everyone who tried the game out on my machine ended up getting hooked. A wide variety of sounds are generated during game play, depending on whether it's a direct or indirect hit, the gun firing, the entrance of the Mothership, or the end of the game. I didn't realize the built-in piezo-electric speaker could make such arcade-like sounds. The fast action combined with the sound effects makes *Sky Raider* a game I can return to time upon time, without getting tired of it. The instructions that came with *Raider* are reproduced on the program if you ask for help at the beginning, so we won't be too harsh on their poor-quality brochure that came with the cassette. Programmers at Alpine Data have shown that by using characters already in BASIC, they can approach the speed and "feel" of a 25-cent-per-play machine. *Sky Raider* is so good, I almost want to insert a quarter into my Model 100 each time I play.

(Alpine Data Systems, Dept. P1, P.O. Box 1157, Elizabeth City, NC 27909, (919) 338-2027, $19.95)

— Jim Hawk

New Products

DataPort Introduces Compact Letter-Quality Printer

DataPort, of El Sobrante, CA, is marketing a new computer printer, offering users "state-of-the-art technology in letter-quality printing at an affordable price" ($295).

The character font is Elite 12, and the printer uses standard typewritter paper, 8½" wide by any length. The computer interface is Standard Parallel (Centronics Compatible).

Smaller than a three-ring notebook and weighing less than five pounds, it has a printing speed of 15 characters per second and a maximum column width of 80 characters. The printer has a full-coverage warranty for 90 days from the date of purchase. Printing is bi-directional, using an ASCII 96-character set.

Contact DataPort, 5525 Olinda Road — Building A, El Sobrante, CA 94803.

BBS 'Wire Service' Offered By Newsoft

A new serivce is being offered by Newsoft — a news service. Newsoft News Service (NNS) is designed specifically to bring daily news and information to local bulletin board systems. It operates much like any wire service and is available to BBSs on a subscription basis for rates ranging from $8.50 a month for a BBS with "network status" to $24.95 for a one time, one month subscription.

Some of the regular columns being offered are a daily computer news column, a hardcore hackers' technical column, history, trivia, science, and a "women and computers" column.

For more information, contact Newsoft Inc. Computer Services, 2704 NE Everett St., Portland, OR 97232 or place a voice call to (503) 238-0741. Also, NNS has a free sample download available at 300 Baud on (503) 235-5114.

Briefcase Games Announced

Micro Software Systems has announced the availability of five new game packages for the Model 100.

(continued on Page 54)

PCM BAR CODED LISTINGS

Before scanning any of the bar code listings contained in this section into your Model 100's memory, please be sure to carefully read the information on this page.

Tips for Successful Bar Code Reading

We are constantly working to improve the quality of the reproduction of PCM Bar Code; however, some of you may experience problems due to minor flaws in the bar code. As you become more accustomed to using the bar code wand, most of your problems will disappear. The following tips should help you become a successful bar code reader.

- Use an even, smooth speed.
- Keep a constant angle to the code (slightly less than 90°).
- Use your arm to move the wand — not your wrist.
- Use a straightedge such as a plastic ruler or an index card to guide your wand evenly across the code. A metal edge could damage your wand.
- If you experience problems scanning a line, move your straightedge slightly up or down and try reading a different part of the code — there may be flaws in the printing on the spot you're trying to read.
- Use a back-and-forth motion when a line does not read in on the first try.
- Make sure that the tip of your bar code reader is free of dust.
- Keep the LED on your bar code wand clean.
- Use a piece of non-reflective plastic, such as the one provided with your bar code wand, to protect the code from scratches.

CALCUL

NOTE: To scan these programs into memory you will need the Bar Code Reader program from last month's PCM. It will be published again in our July issue.

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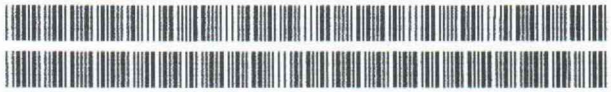
158 
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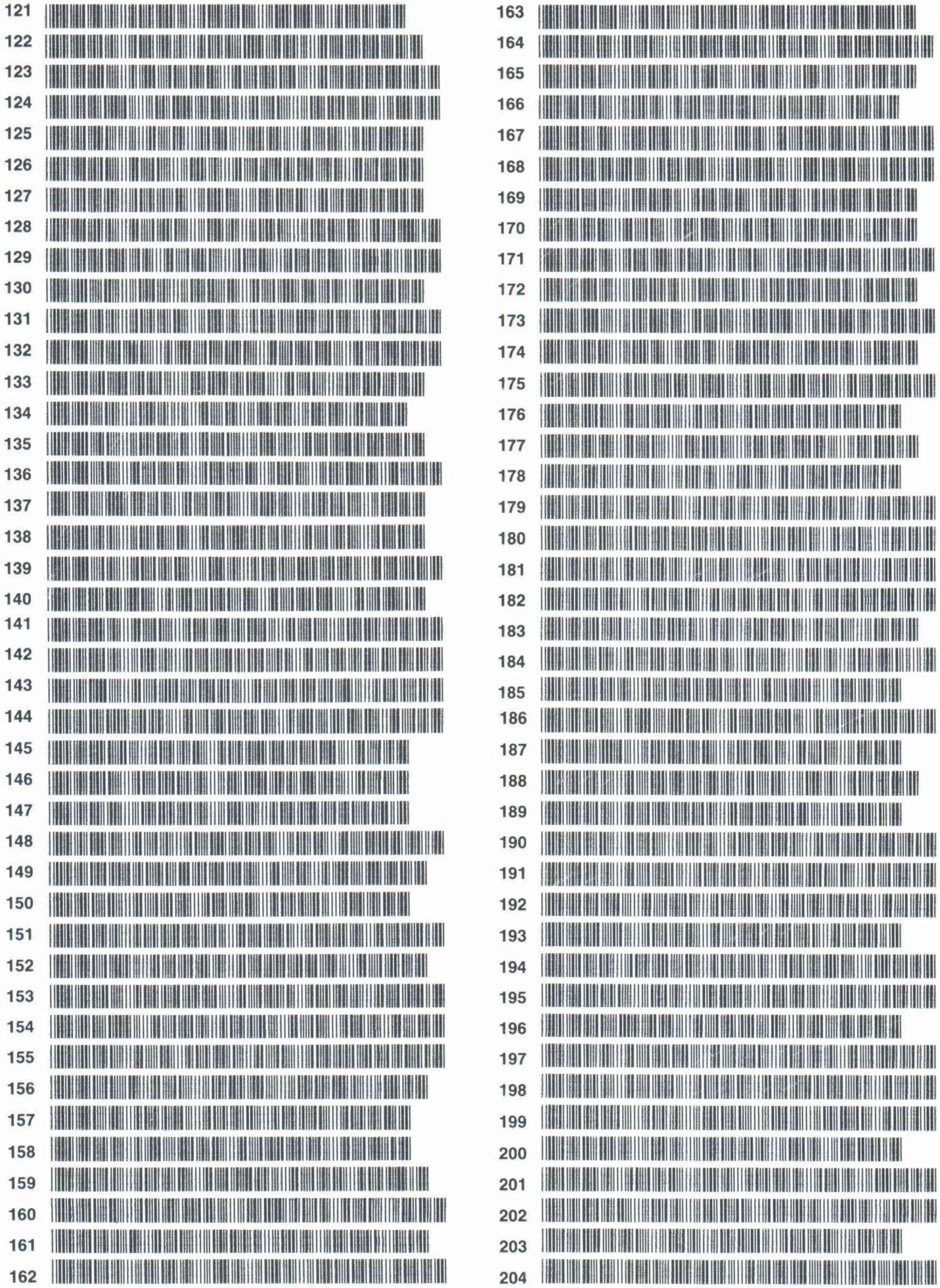
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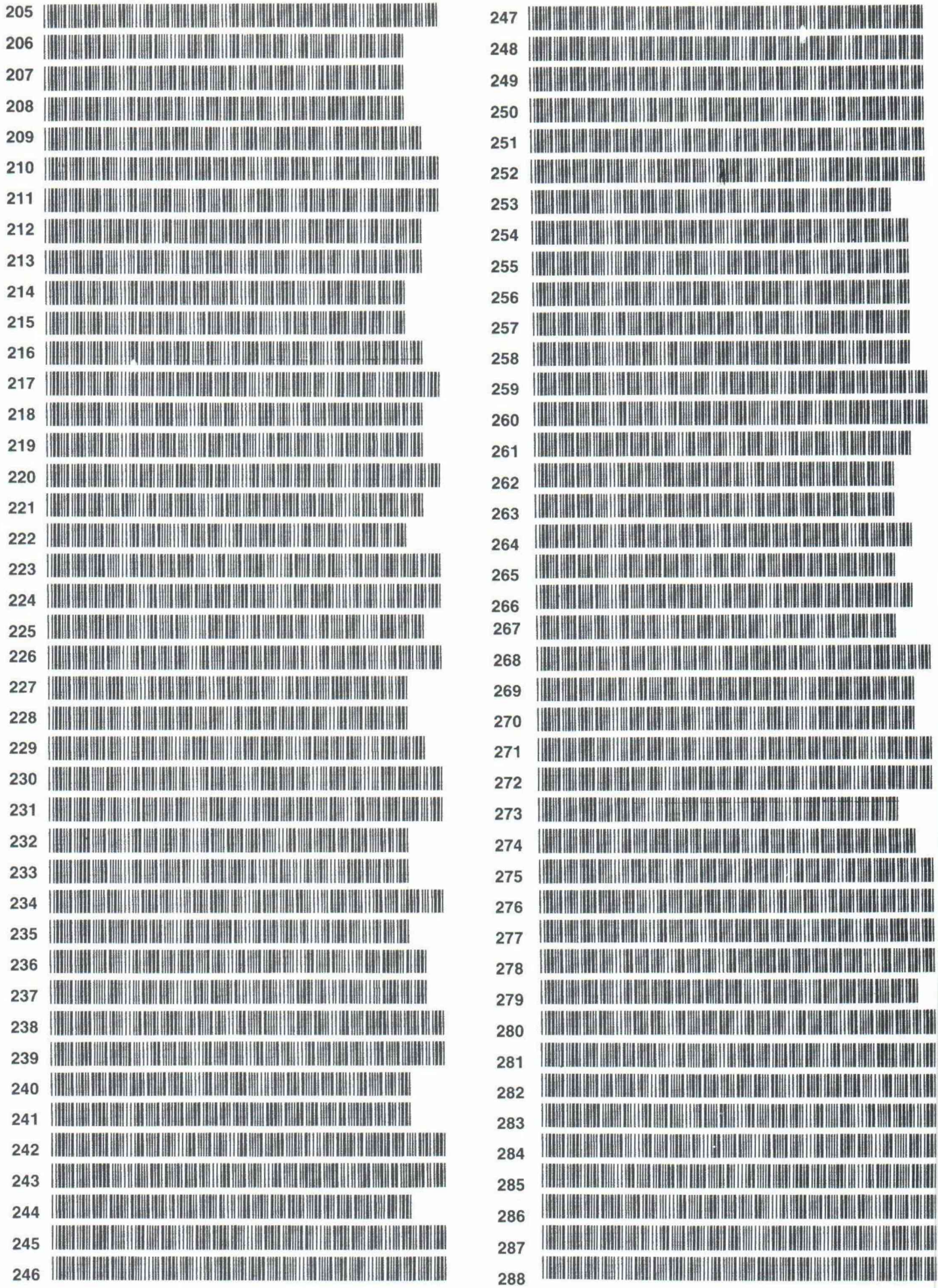
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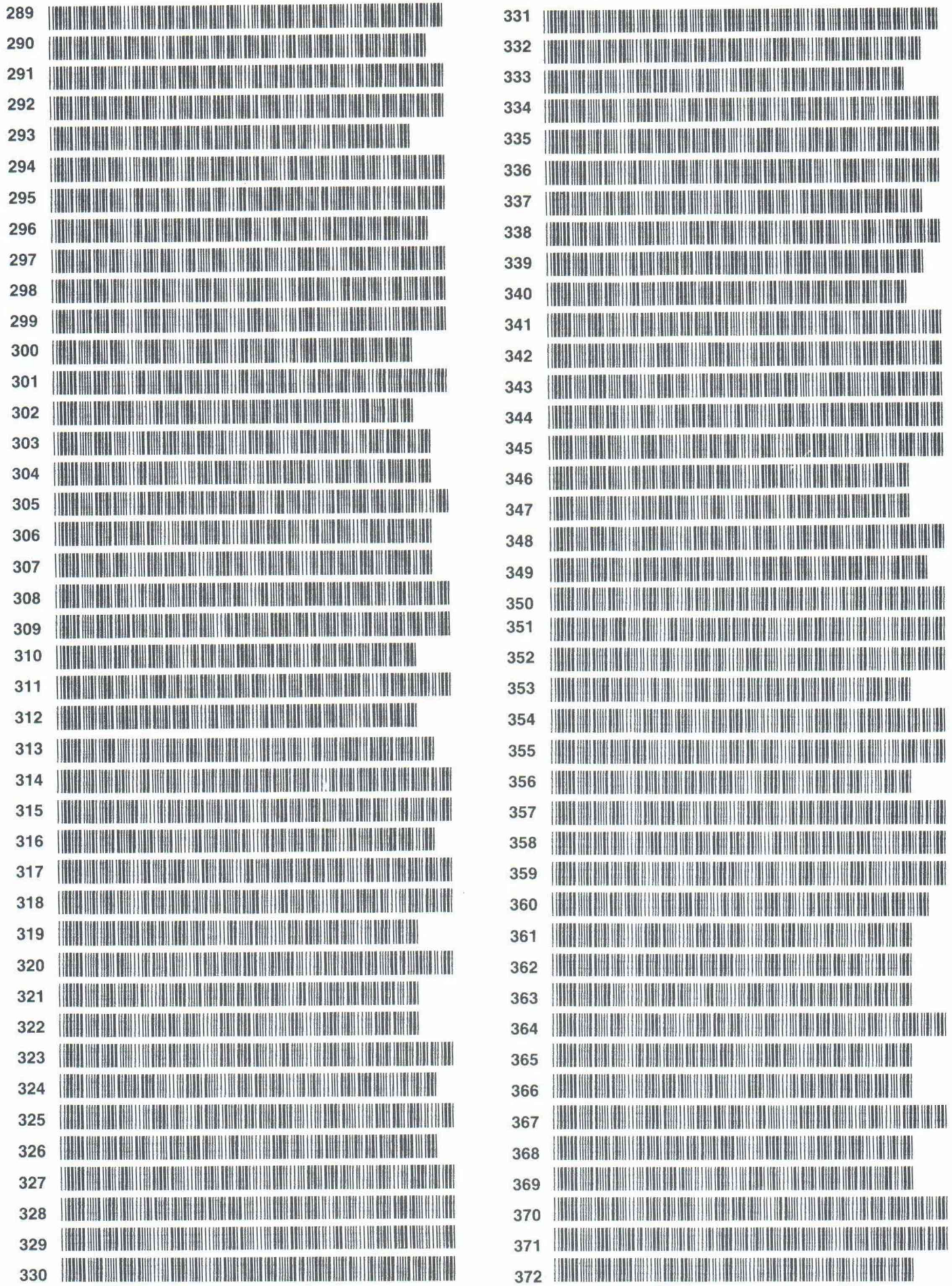
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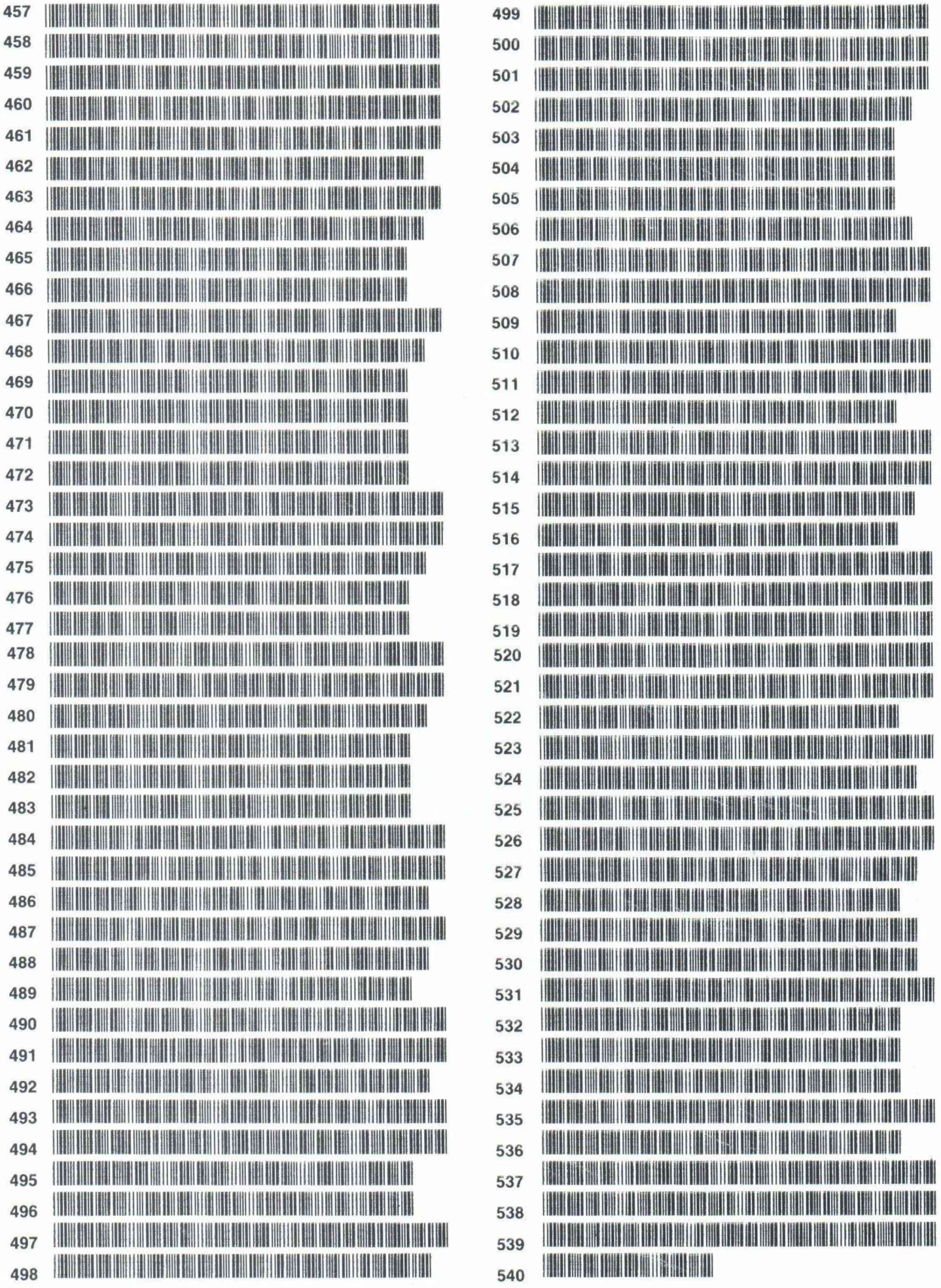
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ALBERTA	
Calgary	Rainbow Software Services
Edmonton	Kelly's Software Distributors
NOVA SCOTIA	
Halifax	Atlantic News

Also available at selected B.Dalton Bookseller stores in the United States and Canada.

(continued from Page 49)

The packs, each containing three games, Casino Games, Fun 'N Games I, Fun 'N Games II, Board Games, and Graphic Games.

Casino Games includes *Blackjack*, *Roulette* and, *Slot Machine*. Nevada rules are followed.

Fun 'N Games I includes *Sketch*, which turns the Model 100 screen into a sketch pad; *Piano*, which turns the keyboard into a five-octave musical instrument; and *Puzzle*, a game where you try to arrange the letters "A" through "O" in alphabetical order in the fewest tries.

The Fun 'N Games II three-game pack includes *High 5*, a yahtzee-like game for one person; *E. T. Invaders*, in which you race around mazes, picking up diamonds; and *Invade*, where the object of play is to destroy descending aliens before they land on earth.

Board Games includes *Backgammon*, *Briefcase Othello*, and *Checkers*. You play against the computer.

The Graphics Games pack includes *Arkade*, *Nim*, and *Biorhythm Chart*.

Each of the five packs are available from Micro Software Systems, 444 North Grove Drive, Alpine, UT 84003, phone (801) 756-4621 at a cost of $29.95 per pack of three games. (Include $1.50 per pack for postage and handling.)

Communications Enhancement

LapLog™, the newest program from portable computer software developer PocketInfo Corp., gives the Model 100 memory-buffer capabilities until now found only on more expensive desktop terminals and microcomputers.

LapLog allows the Model 100 user to scroll through all data sent or received during an online, interactive communication session with a host computer. The user can review the data even during information transmission or reception, a feature similar to multiple screen pages on larger systems. The amount of data that can be reviewed is limited only by the Model 100's memory capacity.

Ghost control characters transmitted during communications sessions but invisible to users are a frequent cause of communications difficulties. *LapLog's* Snoopy mode displays the ASCII number of each control character in reverse video as it's received, helping users troubleshoot the source of communications problems.

Users can invoke *LapLog's* scrolling and Snoopy capabilities by pressing the appropriate function key.

LapLog is available on tape cassette for $39.95. PocketInfo Corp. also provides a user's manual and source code enabling the user to customize the program to unique protocols and requirements.

For further information, contact PocketInfo Corp., P.O. Box 152, Beaverton, OR 97075, (503) 649-8145.

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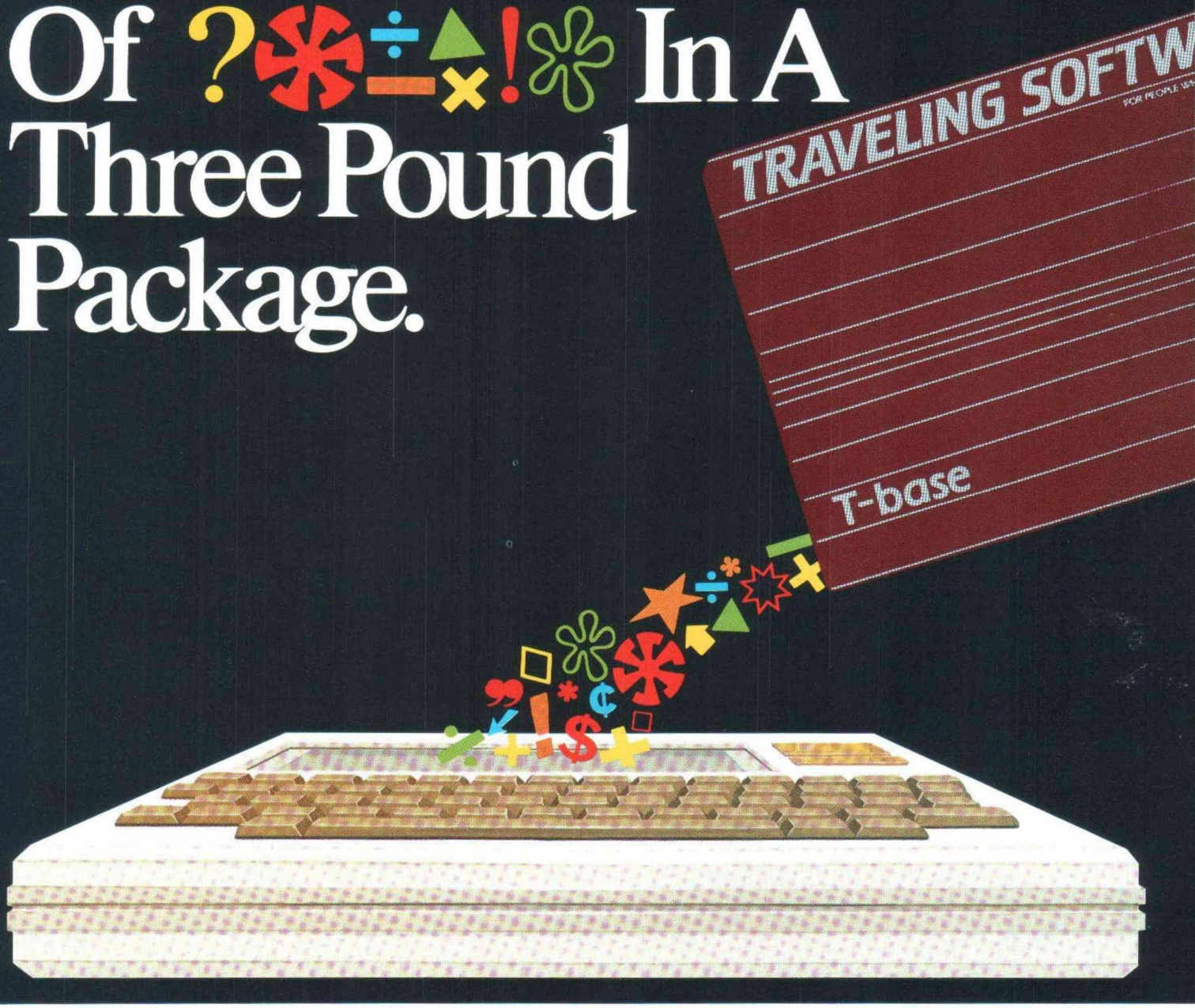

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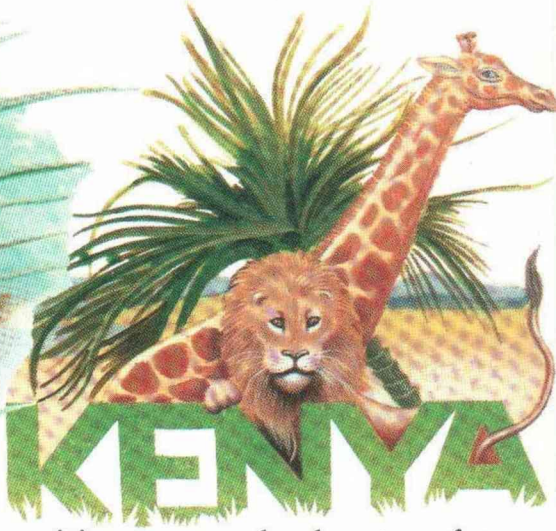

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